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GAINING LAND FROM THE SEA

On the occasion of the opening of the International Course in Hydraulic Engineering, academic year 1958–1959, on October 28th, 1958, A. Volker, Member of the Faculty Committee of the Course, delivered the speech printed below.

The object of the International Course in Hydraulic Engineering is to study a number of hydraulic engineering problems against the background of experience gained in the Netherlands and other countries. Among the various subjects in this field, the reclamation of land in coastal areas situated round about or below mean sea level has always been considered a favourite Dutch topic.
The fascinating work of recovering land from the sea, of peaceful conquest from the tides, however, is not limited to the small area of the Netherlands. Similar works have been undertaken in many parts of the world or are still proceeding there. Therefore I should like to invite your attention for a few moments to the technical features and economic motives of such undertakings. In this way we shall see that the impoldering of low-lying coastal areas and of stretches of sea is not an enterprise of interest only to people wearing wooden shoes, but that it is often an indispensable element in the technical and economical development of the densely populated coastal regions.

I will start with only a few remarks about reclamation works in Holland. This is not because of historical priority – in fact the Chinese succeeded much earlier than we did in fighting back the tides and waves. No, it is simply because these works are nearest at hand.
Only few people in this country know that reclamation works of modest scope already started round about the year 1000 A.D. From that time on, the science of hydraulic engineering developed so quickly that in 1270 or thereabouts it became possible to tackle a fairly big scheme. At that time engineers managed to seal off a tidal river, 300 yards wide, at two places, 28 miles apart, and to surround the low-lying land on either side of the cutoff with dikes. Unfortunately, we know only little about the techniques they used.
Much more is known about the very important works carried out in the 17th century, when many lakes were reclaimed by means of windmills, lakes which at present are situated at an altitude of about 12 feet below mean sea level. It was Jan Leeghwater, a constructor of windmills, who showed his countrymen how to gain new land. His name means Low-Water. Perhaps people gave him this name because of his enthusiasm for draining lakes everywhere. However that may be, in a few decades he changed the face of the country.
The 17th century was an era not only of the conquest of new land but also of many other bold projects. It was Hendric Stevin – a contemporary of Leeghwater's – who

in 1667 launched the idea of damming off both the Zuider Zee and the estuaries in the southwestern delta area in order to check the intrusion of sea water and to safeguard the country's water supply.
As early as the 12th century Dutch people emigrated to other parts of Europe to Russia, Poland, Germany, France – not to drive out the inhabitants, but to settle on land made by their own hands. Visiting these regions nowadays, we see fine arable land protected against floods by the descendants of the first settlers.
You will realize that the Dutch people are rather proud of their ancestors' and contemporaries' activities abroad. Today, however, I would prefer to tell you about the work done by the technicians of other countries – done maybe, in some cases with Dutch advice – to support my argument that gaining land from the sea is not some curious specimen of human achievement invented by ambitious Hollanders but a technical performance of world-wide significance.
Outside Holland there are about 20 to 25 different countries where impoldering and reclamation works in coastal areas have been carried out. It is quite interesting to note the different technical features of these works, varying according to differences in local conditions. To give a general impression, I will confine myself to four examples.

Travelling southwards to France, we see examples of tidal reclamation in the estuary of the Seine and along the coasts of the Atlantic Ocean and the Mediterranean. In the 11th and 12th centuries, works in France – just as those in Holland – were initiated by the monks of the abbeys. A further step was taken on the initiative of King Henri IV and his minister, Sully, who called in a Dutch engineer named Bradley or Braat, but real progress was only achieved by Bradley's successors. Later on, Napoleon was interested in impoldering works, which he gave considerable support by wise administrative measures.
Owing to the successive impoldering of the tidal foreland which had become silted up to the level of normal high water, and to the lengthening of the river mouths, the drainage of the land lying in the interior became more and more difficult. It is curious to note that this did not slow down the reclamation works but led instead to increased activity, as impoldering near the sea was considered a less complicated and less expensive undertaking than improvement of the drainage of the existing land, by widening the watercourses and the canals and by installing pumping devices. Thus we come across the so-called wet marshes in the interior, with their abundant vegetation, and further seaward, the so-called reclaimed marshes, with a landscape reminding us of that of the new polders in Holland.
There is no acute shortage of arable land in France today. Yet the French government is nevertheless striving to see the reclamation works continued.
The polders along the coast of Portugal are of recent origin. In the period of Portugal's maritime expansion no one was interested in the possibilities of increasing the area of the mother country by patient and troublesome labour. Here, therefore, the 16th and 17th centuries did not become, as in Holland, France and Japan, the era of peaceful conquest of land from the sea. It was not until the end of the 18th century that the famous Marquis de Pombal – the restorer of the city of Lisbon – took the initiative in starting reclamation works in the country's gulfs and lagoons. Today we can see the polders in the lagoon of Aveiro in the north of the country – the city with canals and attractive baroque houses reminding us of the cities of

Friesland, in the estuaries of Sado and the Tagus, near Lisbon – where the Leziria-polder of 32,000 acres ranges among the biggest polders in the world – and under the hot sun of Algarve along the southern coast of Portugal with its white Arab houses and its olive trees.

The climatological and pedological conditions of these polders or "salgados" are such that unless there is adequate irrigation, the land can only yield rather a poor crop of winter cereals. But if fresh water is available, the polders can be turned into rich paddy fields yielding maximum crops. Therefore, the technical problem of reclaiming polders along the sea in this country is above all a problem of finding fresh water in the coastal areas, a problem which – as we shall see later – may be rather critical.

Making new land along the coasts and turning the sea bottom into handsome paddy fields have always been considered as important factors in the national economy of Japan. One may assume that the first works of this kind were executed in Japan about 1600. Sometimes much earlier dates are mentioned, but these probably relate to the reclamation of elevated land, so that only protection against exceptionally high sea levels was necessary.

A famous name in the history of tidal land reclamation in Japan is that of the daimyô Katô Kiyomasa, a feudal lord who lived near Kumamoto in Kyûshû, Japan's southernmost island. He carried out many reclamation works in this region, the first perhaps having been Tamana County, in 1589.

In the history of architecture Katô Kiyomasa is well known as a builder of castles and fortresses, and we can imagine that he designed his dikes just like the walls of his castles: as heavy bodies of stone with a steep front face. Japanese poets of that time sing of the enchantment of the new land's scenery and we can read how Katô Kiyomasa, then a handsome young man of 27, who could look out upon the tidal foreland from his castle, would go spurring his favourite horse from Kumamoto to Tamana to supervise the works.

So urgent was the need for more arable land that the Japanese engineers did not wait before starting embankment works till the moment that the land had been silted up to the level of normal high water, as was done in Holland, France and Portugal; instead they reclaimed the land as soon as it had reached the level of low water at neap tide.

From Japanese data we derive the information that in the course of time some 356 square miles of land have been gained from the sea by gradual embanking, and dikes constructed to a total length of about 1,125 miles.

In recent times land reclamation has been speeded up by the execution of big schemes. The basic technical principles of the Zuider Zee Works in Holland, namely the partial reclamation of an enclosed area of the sea in combination with the creation of a fresh water reservoir, have been adopted for the Kojima Bay Works near Okayama, which are now almost completed. This year work started on the reclamation of a vast lagoon of a size of about 50,000 acres. By combining Japanese experience and Dutch advice, a project has been drawn up for the future polder which, when completed, will be one of the lowest lying areas in the world.

I can only refer briefly to the last of my four examples, although it might be called the most curious and most interesting case of all. It provides an example of gaining land from the sea in a country long noted for its abundance of arable land, and waiting only for the farmer to till it. It is Canada, where a bay of Lake Huron has been laid dry by a transverse dike and lateral canals, built at a high level, for the

diversion of the water. It is a curious sight to see the regular pattern of these small parcels of land in this area amid the immense, gently sloping hills of Canada.
A further and bolder step will be the reclamation of Boundary Bay near Vancouver, on the border between Canada and the United States.
Having considered these examples – only a few taken from the long list of countries – we are faced with the question: what motives have led to impoldering and damming-off in coastal areas? In fact, such works are, generally speaking, rather expensive; moreover the recovered land is exposed to the risks of flooding and – as we shall see – the execution of reclamation works of this type involves a number of technical problems, embracing various branches of hydraulic engineering.
Shortage of arable land due to over-population in rural districts is an obvious reason for embarking on the peaceful conquest of the sea. If the cost of the works exceeds the value of the land, considered from the point of view of private enterprise, the State promotes the works, which are then considered as justified from the point of view of the national economy. The best examples of motives of this type are provided by the present position in Japan and Holland, where extensive reclamation works in the coastal districts are in full swing and where the State is building for the future of the nation's economy.
This is not true, however, of the important reclamation works carried out in these countries in former times; nor does it explain similar works carried out in many other places throughout the world.
In Holland in the 17th century – a century which saw the production of new land reach a peak – the promotors were a group of rich merchants from Amsterdam, looking for a safe investment for their money. Exactly the same period was also an era of great reclamation achievements in Japan. The feudal lords – the daimyôs – commandeered farmers to carry out works and handed out arable lands among them as compensation for their labour, when the works were completed. Then taxes were imposed, the revenue from which could be used for various purposes. This is a sound way of financing, which is still in use all over the world.
There is undoubtedly another reason for tackling the kind of work we are now discussing. Coastal areas range among the most densely populated parts of the world. The rise of most of the great civilizations of the world has been determined by their contact with the sea, which allows easy communications and imposes clear delimitations. Man has always looked to the sea, rather than to the land. Recovering land from the sea satisfies, in a noble way, the human lust for conquest; it meets the local interests of the coastal regions, the first place where, in the course of history, the need for more arable land has been felt. This factor might have been the deciding one in the case of the undertakings I mentioned in France and Portugal.
Apart from the economic and sociological reasons, there is a simple technical factor which makes impoldering works so attractive. The top layer of clay of marine origin appearing after the removal of the water has a great natural fertility, provided that proper treatment is applied to remove the salt. The new land is almost perfectly flat, which means that perfect water control can be obtained by means of an adequate drainage and irrigation system.
Moreover, there are some additional advantages in carrying out enclosure works and the partial reclamation of sea arms. The shortening of the coast line provides better protection for the existing land against floods; the intrusion of salt can be checked effectively; the creation of fresh-water reservoirs becomes possible; navigation

facilities can be improved; new land becomes available for industrial and urban extension, and so on.
Sometimes these additional advantages raise the projects concerned to the level of real multipurpose projects with benefits for quite a large group of various interests.
Gaining land from the sea is not only a profitable business; it is also the kind of work which gives much satisfaction to the technicians in charge of it. This is closely bound up with the fact that it is a many-sided work, and we shall see that it embraces many items of the three branches of hydraulic engineering taught in this International Course.
In the first place, the shutting off of tidal inlets, estuaries, bays or gulfs of any considerable size from the sea requires a careful examination of the consequences with respect to the tides and tidal currents. Any changes therein will entail repercussions both for the reclamation project to be carried out and for the adjacent coasts and waterways. In this way we enter the domain of tidal and coastal engineering.
To design the drainage of the enclosed area adequately, it will be necessary to know all about the new tidal conditions and the development of the channels and gullies outside, on which the possibilities of discharge of superfluous water largely depend.
The operation of closing a tidal basin is another problem which calls for a sound knowledge of tidal phenomena. When we narrow the last gap in the enclosing dam, the velocities of the tidal currents increase considerably. In the case of easily eroding soils, the whole operation may end in failure, unless special measures are taken to prevent scouring of the bottom and to perform the final operation of sealing in a minimum of time.
The planning of the tactics to be used is always a delicate problem and considerable guidance may be obtained by comparing practical experience with the results of tests with models.
The protection of the low-lying land in the reclaimed areas forms another special coastal engineering problem. The safety of the inhabitants depends on the adequacy of the design of the dikes or embankments. A serious limitation in this respect is that in most cases only material available in the locality can be used and another is that it is not always possible to use the most suitable equipment.
Often the dikes have to be built in the open sea and the work can then only be done by modern dredging equipment. In some cases, ignorance of the possibilities provided by floating plants for earth work has led to the abandonment of projects which otherwise would have yielded considerable profits.

Practical experience is indispensable for the adequate design of the dikes but especially in the case of bodies on a soft foundation soil the use of geo-technical investigations by soil mechanics can help to avoid gaining experience by hard knocks.
It is obvious that the operation of turning the bottom of the sea into arable land is primarily an item of reclamation engineering. Many problems are quite similar to those encountered when reclaiming marshes, peat bogs, peat moors or lakes. As in these cases, the design of impoldering works in coastal areas should take the agricultural requirements as a starting point. Then the elaboration of the project should be carried out by close collaboration between the hydraulic engineer and the agronomist.
In order to ensure effective collaboration, the hydraulic engineer should have a general working knowledge of agronomy, especially with regard to the problems of the desalinization of alkaline soils.

As in the case of reclamations inland, it will often be necessary to provide the new land gained from the sea with irrigation facilities. But then the problem arises: where to find water in sufficient quantities and with a salt content not too high to prohibit its use as irrigation water, especially during the periods of drought.

This is an intricate problem, since the construction of reservoirs in coastal areas by building high dams in valleys is often impossible due to topographical conditions. The obvious solution is to leave a part of the area shut off from the sea under water, so as to form a reservoir. This is only feasible, however, if a study of the hydrological and geo-hydrological conditions has shown that the salinity of the water in the reservoir will be sufficiently low. This requires the drawing up of water and salt balances for both the area to be reclaimed and the area to be used as a reservoir. Here the various sources of salt intrusion should be estimated quantitatively. (Such sources are: entering of salt water by sluices and ship locks, penetration of sea water into the estuaries and rising of water with a high salt content from the subsoil.)

A study of the ground water conditions is of the utmost importance, especially in the case of the reclamation of land below mean sea level, since the difference in head between the new land and the surrounding areas will generate a ground water movement by which the water in the deep subsoil, water which is often quite brackish, will rise to the surface as seepage. Geo-hydrological investigations carried out recently in connection with great reclamation schemes in Iraq, Japan and Holland, have shown that geophysical prospecting methods (and especially the geo-electrical resistivity method) can provide the required data in a rapid and economical way, when combined with drilling operations of modest scope.

It is not sufficient, however, to meet only the elementary requirements of safety, land use, drainage and irrigation, transport and settlement. Reclamation often means the creation of a new district and then the physical planning of the new land presents features similar to those of town planning. Many specialists working in different fields are required for the work of planning the layout and there should be good teamwork. Since coastal areas are often flat and salient features in the vicinity of the reclamation schemes are lacking, special consideration should be given to the landscaping of the area, to break the monotony and vastness of the bare new land. Thus it will be most desirable to enlist the aid of landscaping experts to draft a "landscape plan" in close collaboration with the technological, agricultural, sociological and other experts.

Finally, we often have to call on the third branch of hydraulic engineering, that is, rivers and navigation works. Sometimes we have to divert watercourses and even rivers and give them new outlets to the sea. Then we have to be aware of possible modifications in the transport by the rivers of solid matters and in the position of their bed. This is one of the central problems of river engineering.

The accessibility of the enclosed or reclaimed area to shipping requires the construction of ship locks, while the system of navigation canals in the reclaimed area should be planned in such a way as to meet the requirements of transport and so as to make its combination with the drainage system possible.

The wide variety of problems involved in the reclamation of coastal areas provides an excellent opportunity for prospective engineers to get a sound training in the various branches of hydraulic engineering. Working on the creation of new land, seeing the birth of virgin soil, is an experience which may affect a man's destiny for the rest of his life.

Goethe, the German poet, must have had this achievement in mind when he drafted the second part of the tragedy of Faust. The last scene of the fifth act is laid in a land newly wrested from the sea. Through it stretches a wide and straight canal at the end of which Faust's palace has been erected. Neither the mastering of occult science nor the pleasures of youth and love have brought him the consummation of his ambitions or taught him the deepest meaning of life; only the struggle for existence on a new and free soil can do that, so that the tracks of his existence will not vanish into nothingness.

Gaining land from the sea is not a monopoly of the Dutch. I had a most pleasant time discussing the relevant problems with Polish, French, Portuguese and Japanese engineers and exchanging experiences on the fascinating work of fighting back the sea. I was glad to hear that they still look to the Netherlands whenever they want to tackle the design and execution of schemes of unusually large scope. There are adequate facilities in Holland nowadays for ensuring technical collaboration. But it will always be necessary for background information to be available, and for the responsible engineers working together to be familiar with the conditions and problems in their respective countries.
It is my sincere hope that the International Course in Hydraulic Engineering, now starting out on a new academic year, will contribute to the diffusion of hydraulic engineering knowledge and also to friendship among engineers from all parts of the world.

FIFTIETH ANNIVERSARY OF THE BRAIN INSTITUTE AT AMSTERDAM

A personal invitation was recently sent to a limited number of the world's foremost neuro-biologists to attend a scientific meeting, to be held in September next on the occasion of the fiftieth anniversary of the Netherlands Central Institute for Brain Research at Amsterdam. This select congress is also to pay homage to the memory of C. U. Ariëns Kappers, the Institute's first director. Within a few weeks most of those who had been invited accepted the invitation and such in terms stressing their warm appreciation for this eminent Netherlands man of science.

He was, indeed, an exceptional person, who was chosen at an early age to give shape to the aforesaid Institute. Following his studies at the University of Amsterdam, he worked for a time in Heidelberg with Edinger, the founder of the comparative anatomy of the central nervous system. It was there that he made the remarkable observation that the nerve cells — then considered to be immovable elements — are not in different animal species located in corresponding places. He could even speak of a "quadrille des noyaux," namely, a game of puss in the corner of those groups of nerve cells forming the motor centres. And with telling intuition he had found the rule governing these migrations: each part of a neuron (cell body, neurite and dendrites) strives to seek a point where stimili are active which tend to occur simultaneously with the own impulsion. In that day of tropisms and taxis, he assumed that an attraction lay at the root of this, which he indicated by the name of neurobiotaxis. Numerous are the examples which he and others after him were to denote as being consistent with such an influence. The neurobiotaxis was regarded as a primary influence to determine the structure of the nervous system. And with this the Netherlands had found a researcher of great promise who could bring the maturing plans for a brain institute to realization.

The international initiative to found national brain institutes had been taken partly because of the great significance of the brains in living nature, and partly because of the fact that the finer structure of this organ could be examined only by means of special techniques, so that the university laboratories for general anatomy confined themselves largely to the coarser forms thereof.

True, all over the world the aforesaid finer research was already in the ascendant within the neurological clinics, but there it was naturally directed mainly to the diseases of this organ. And although in many cases it was especially these diseases that yielded data of the utmost value — also for the unravelling of the normal coherences — the establishment of an institute where researches would be concentrated primarily on the normal features of this important organ, so extremely difficult to work on, was felt everywhere to be highly desirable. This desire struck a particularly responsive chord in the Netherlands because in those days neurological research had already flourished greatly there, especially through the efforts of Cornelis Winkler, the Amsterdam professor of nervous diseases.

Winkler had soon collected a devoted circle of young co-workers around him and had aroused others outside this direct circle to similar activities. In addition to his practical work, with unflagging industry and steady toil and always by means of one set method of research, he had brought to light an invaluable amount of new learning concerning the brains and the spinal cord of the normal individual. When a small area of the central nervous system is destroyed by a local pathological

process, and the patient goes on living for a time, the nerve fibres issuing therefrom go to ruin and elsewhere the nerve cells which had stretched out their main fibre, the neurite, to that particular area, also disappear. Again and again his delicate and skillful pen traced such changed conditions in a number of such brains, and from this his at once eager and critical mind slowly built up a picture of the normal coherences between the diverse parts of the brains and the spinal cord. Coherences which, in view of their confusing quantity, are indiscernible to the observing eye without the aid of such a special method. This information was later assembled into a manual that has since become world famous and still constitutes a rich and reliable source for present-day neuro-biologists and clinicians.

His atlases of the cerebral stem, compiled in collaboration with Ada Potter and an atlas by Jelgersma, likewise testify to his work.

For this reason the foundation of a brain institute was exactly what appealed to him, and he was supported in this by Louis Bolk, the well-known Amsterdam professor of anatomy. Struck by the fact that man distinguishes himself from other vertebrates specifically by the powerful development of the brains, this original researcher had always been attracted to the problems of the nervous system. Together they approached the Netherlands Academy of Sciences, suggesting that steps be undertaken to found an institute of this kind. The Government, reacting to this proposal, gave it the status of a State institution directly within the province of the Ministry of Education, Arts and Sciences, while the Amsterdam Municipality gladly offered to provide the necessary accommodation. The Institute was officially opened in 1908.

For nearly 40 years, until his death, C. U. Ariëns Kappers, as the first director served the Institute excellently, in the meantime giving it great renown abroad. Curiously enough the direct cause of this fame outside the country borders was an extensive criticism that had been published by him in reply to an important American publication. This critism was so constructive along a new line of thought that it aroused general interest and appreciation.

Kappers, also, used one constant working method. He assembled the brains of a great many species of vertebrates, on the one hand to build up from carefully prepared specimens a choice museum collection, and on the other hand to set up from other specimens a unique collection of microscopic slides. These preparations consist of serial sections in most of which the medullary sheaths are coloured according to Weigert-Pal and the nerve cells with carmine. Both collections still attract a great many foreigners as such study material is not to be found anywhere else.

The microscopic technique which was used indicates that Kappers was not concerned with the ultra-fine structures of the nerve elements. Rather, his objective was to trace how the many groupings of nerve cells and their tracks in the higher species have sprung from the simpler of the lower animal species. In this way he basically improved and refined upon the classification of the brains. His comprehensive book on the comparative anatomy of the central nervous system is still the fruitful vade-mecum of present-day workers in this and related fields.

Kappers was the man of the international contacts. On his many world journeys he gave numerous lectures and, for a year, was the first professor of anatomy at the Rockefeller University of Peking. Moreover, a large number of foreigners came to work with him on comparative neuro-anatomy at the Brain Institute. His con-

siderable erudition, his high-toned and optimistic idealism, and his wellnigh prophetic personality enabled him to conclude and maintain strong ties of friendship with many in nearby and distant countries, including China and Japan. To-day, several of his former pupils occupy prominent places in the most widely scattered universities.

During the last years of his life Kappers devoted himself more and more to the differences between the human races, passing on especially to the study of skull measurements.

After his death, in 1946, the Amsterdam professor of clinical neurology, B. Brouwer, was appointed his successor. For many years the latter, as assistant director, had carried out much research work at the Institute on pathological material in connection with the coherence and the specific localizations of neurological diseases. In a happy contact with the results of Kappers, he especially brought to the fore the curious phenomenon that newly acquired parts of the brains — therefore those which have developed into separate areas only in the higher animal species — are frequently struck in particular by degenerative diseases. Less confined to comparative anatomy than his predecessor, he attached to the Institute J. Droogleever Fortuyn — who was later to become professor of neurology at Groningen — with the result that electroencephalography made its entry there next to the aforesaid branches of anatomy.

Brouwer's directorate was, alas, to be of short duration as death took him from us in 1949.

In the Supervisory Committee it was then the Leyden professor of histology, S. T. Bok, who pleaded for a reorganisation of the Institute. He suggested that in an institute devoted to the study of a specific organ, this organ should be investigated in any and every apparently useful manner. The problems presented by the central nervous system demand a combined approach from many points of view, such as the morphological, physiological, physical, chemical, mathematical, as well as, for example, the developmental and pathological angle. It may well have been right that in the preliminary stages under Kappers only one direction, that of comparative anatomy, was followed — as was stated above the pathological work of the assistant director was also directed by and on this special branch — but a sound development can be attained only by the institution of different departments, each under the inspired leadership of a specialist who must additionally have the ability to work together with the other leaders. In this way the structure becomes other than that of a university laboratory, where the work is solely in one direction, for instance, that of anatomy or experimental physiology, and the leader chooses his special object to study in that one given direction. Here, on the contrary, the object is given, namely, the central nervous system, and this demands many directions of research. And it is precisely from the collaboration between these differently trained researchers within one institute that original thoughts may be born — thoughts which will indicate new roads for the approach of mysteries that are so interesting and probably important to humanity also, and which, concealed in our brains, give direction to so much in our lives without us yet knowing how and to what purpose. Without doubt such a design is hazardous: the director must be someone who can survey many different working directions and can link them mutually; the department leaders must be willing and able to co-operate among themselves. The future of scientific research demands such a combination of specialization on the one

hand and co-operation on the other. Let the Brain Institute attempt to set an example in this respect.

The prospects were favourable in the Netherlands. Widely divergent laboratories were interested precisely in the nervous system. In Leyden histology was concentrated on the cerebral cortex; in Groningen anatomic work was carried out on the nervous system, including its growth; in Utrecht on the deformations thereof.

In the field of physiology Magnus at Utrecht with his pioneering work on posture had aroused the interest of many, including that of G. G. J. Rademaker, who subsequently investigated the function of the red nucleus and at Leyden that of the cerebellum with such magnificent results. Furthermore, the Amsterdam physiologist J. ten Cate, concentrated wholly on the electro-physiology of the nerve tissue. In the field of biochemistry it was H. G. Bungenberg de Jong at Leyden who, with his chemical coacervation experiments, tried to approach the structures of live matter, whereby the phenomenon of irritability came within his field of vision.

Some years elapsed before the Government was prepared to grant the funds to commence the execution of this new plan. When the Amsterdam Municipality also co-operated by promising more extensive accommodation, the initiator accepted the directorate — never suspecting that the promise to provide the so urgently needed larger building is, even now, still no more than a vague promise.

Departments were successively established for histology, comparative anatomy, physiological biology, electro-physiology and biochemistry.

Bok's own scientific work had always been focussed on the central nervous system, primarily on the microscopic structure thereof. It had begun in the Brain Institute now entrusted to his care, when, as a medical student, he carried out an embryologic investigation there on the development of the nuclei and tracks in the medulla oblongata. This led to his theory of stimulogeneous fibrillation: a nerve fibre originates there, where in the still undifferentiated protoplasm stimili are already frequently conducted. This theory, which was meant to be phylogenetic rather than ontogenetic, was subsequently verified in an unexpectedly convincing manner by varied experimental embryological work (especially in America). Shortly afterwards he pointed out that neurobiotaxis and stimulogeneous fibrillation together must lead to the origination of reflex arcs between certain sense organs and those specific muscles and glands which, through their action, tend to stimulate precisely those sense organs. The reflex arc therefore forms part of a closed reflex circle. Not till very much later was this principle rediscovered in the fundamentals of cybernetics.

By reason of his conviction that histological research would benefit greatly by the systematic measuring of tissue parts via the microscope and the search for rules in the measurements to be thus obtained, he developed this working method and introduced it into his researches on the morphological composition of the cortex of the forebrain. With a number of co-workers he pointed out simple fundamentals in this structure, inter alia, in the forms and sizes of the nerve cells, their nuclei and their dendrite trees, in the manner in which the well-known stratified structure and the architectonic fields of this cortex follow from them and in the manner in which the structure of the cortex varies according to the stature of the animal species and according to their place in the natural system of Linnaeus.

The complex of nerve fibres located in between the cells of the cortex proved in

man and in animals to have the same density and a peculiar identical structure everywhere, which gave rise to the conjecture that as yet unknown globular units of constant size are located in between these fibres. Following up on this research work in the Brain Institute, F. C. de Waal demonstrated by means of Zernike's phase-contrast microscope that these bulbs do indeed exist, that they have many characteristics in common with vacuoles, and that moreover almost every one of them contains a mitochondrium. In the embryo they occur immediately before the nerve fibres which evidently grow in between them. Their location among the nerve fibres displays so much analogy with those of the sensitive elements in an artificial (electronic or magnetic) memory apparatus, that the possibility is suggested that these vacuoles form a special organ for the advancement of memory. Various further particulars are in agreement therewith.

In the histological department of the Institute H. van der Loos showed that not only neurites establish intimate connections with succeeding neurons (where the stimulus is transmitted from one neuron to the other), but dendrites do as well. Such dendro-dendritic meetings are necessary, inter alia, for the aforesaid memory theory.

In the electro-physiological department J. P. Schade studied the origin and the deterioration of the electroencephalogram. He demonstrated, among other things, that it occurs during the ontogenesis at the moment when the previously mentioned vacuoles reach the surface of the cerebral cortex, so that these vacuoles apparently afford the opportunity to conduct these electrical thrusts forward. By means of electrical registration the neurologist J. J. van Straaten is investigating the course and the influence of optical stimili in the living brains. Both studies are carried out with an electronic apparatus which was designed by Bok in Leyden and was constructed in the electronic workshop of the Brain Institute. It contains amplifiers which are not, as current appliances, temporarily blinded when, in the vicinity of the registration electrodes, an electrical stimulus is administered to the tissue.

At the request of Miss E. Crosby of Ann Arbor, such an apparatus has also been built for her in Amsterdam.

Biological physiology is carried out by Dr. J. Segaar, who removes parts of the forebrain from sticklebacks in order to determine how the intricate pattern of actions necessary for the reproductive faculty, is changed thereby.

His operations are anatomically controlled by R. Nieuwenhuys, who is in charge of comparative anatomic work. It was he who demonstrated that the forebrain of the bony fishes does not, as was formerly assumed (and still is to-day by J. Droogleever Fortuyn) owe its specific shape to inversion, but to eversion. His main work concerns the ascensus medullae, of which he showed that this is not based on a general influence but on a transformation of the spinal cord segments which are located at the level of an extremity. This transformation is based on a histological differentiation which, just as that of the extremity's muscular system, occurs in a horizontal sense.

Mrs. E. A. Nijhoff-de Boer revealed that the extension of the allocortex cerebri (the old part) is determined solely by the stature and not, as the isocortex (the new part), partly by the place of the animal species in the system of Linnaeus (by the degree of cephalisation).

All these working directions have an important trend in common: measurements

are taken in each department and conclusions are drawn only from the figures thus obtained. In biology also it is high time that this branch by means of measuring develops into a real exact science. A summarized survey of what has been attained in this respect on the cerebral cortex is given in "The Histonomy of the Cerebral Cortex," a book by the director of the Institute which is shortly to be published.
Thus, despite the oppressively small space and the too limited funds available, the reorganisation is beginning to be outlined which, for an institute engaged in the scientific research of a normal organ, is so obviously necessary and useful: far-reaching specialization in mutual collaboration.

S. T. Bok [1]

[1] Dr. S. T. Bok is professor of neuro-biology at the University of Amsterdam and Director of the Netherlands Central Institute for Brain Research at Amsterdam.

DR. VIZIOLI GOES THROUGH THE MILL OF "EXCERPTA MEDICA"

The following article, written by Tom Pauka, a distinguished journalist, was taken from the Netherlands weekly "Vrij Nederland." The item on "Excerpta Medica" under "Institutions" in this issue was taken from the same paper.

This is the story of *referent 4647,* page *929* of *Section VIII "Neurology and Psychiatry"* of *Excerpta Medica,* September 1958.

Somewhere in Italy a seventeen-year-old girl enters a butcher's shop and asks if she can borrow a knife. The butcher, who knows her, shows her one and asks if that is what she wants. No, she replies, she would rather have a longer knife. Then, taking the borrowed knife with her, she goes home and stabs her father to death with it.

Juridically this does not appear to be a difficult case. To take a person's life with a knife that was especially borrowed for the purpose is and can be nothing but premeditated murder. But for one reason or another the public prosecutor hesitates, and requests Dr. R. Vizioli of the Neurological and Psychiatric Clinic of Rome University to report on the girl.

Dr. Vizioli sets to work. The girl's father, grandfather and uncle are alcoholics. An uncle on her mother's side committed suicide. The girl herself imbibed more than the quantity of alcohol considered normal in Italy. The relationship between father and daughter had been very bad from the start, and the deed was committed after a violent altercation.

At first, nothing very startling comes to light about her health. She suffered occasionally from a so-called "twilight state" – a short period during which her consciousness was lowered, but which went practically unnoticed by others. She was unable later to give an accurate account of what she had done and said during such moments. She had pleurisy at the age of twelve and the usual children's diseases. And then, finally, comes the information that is necessary to give the whole examination a definite direction. Her mother discloses that the birth of this girl had been very difficult. The confinement is theoretically reconstructed and it is concluded that during birth there must have been a heavy pressure on the girl's skull.

At this relevant information it is decided to draw a three-dimensional map of her brains and to apply three different methods simultaneously. The three conclusions are identical: the girl displays damage to the brains in two places in the so-called "temporal lobes" which was probably incurred during birth.

Dr. Vizioli goes carefully into the case again. Actually there is nothing special the matter. People with similar damage to the brain tissue often have periods when they act, react and talk quite logically while their consciousness is eliminated to a very considerable degree. They are unable later to indicate even roughly what they really did during that time. All this is known to every neurologist and psychiatrist.

Yet Dr. Vizioli decides to give a precise account of the case in writing, and his article on the subject, published in the professional periodical "l'Ospedale Psichia-

trico" carries a few paragraphs motivating his decision. There can, he says, hardly be a stronger argumentation than this particular case to convince jurists of the necessity of making everybody who has committed a serious offence undergo a medical examination. Failing such an examination, this patient would have been accused of premedidated murder. It is now known that nothing but an accident was involved. It is essential that these cases be published in full detail because psychiatrists who are called upon to report on a similar case are better able to convince the judical power if they can cite examples.

Dr. Vizioli is right, of course. But his article appears in an Italian professional journal which is not read by all Italian psychiatrists. And all other psychiatrists in all other countries, to whom this case may also be of major importance, have never even heard of "l'Ospedale Psichiatrico."

Yet they can all read a summary of this case history almost immediately after Dr. Vizioli's article is published. Moreover, if they need an example such as this they will certainly read it because nearly all of them have the abridged version almost within their reach. Excerpta Medica, the largest organisation in the world to publish scientific excerpts in the medical field, subscribes to "l'Ospedale Psichiatrico" – just as it also subscribes to all medical periodicals of the first and second order, wherever they appear throughout the world.

The Eighth Section

Somewhere on a key point of the central nervous system of Excerpta Medica – which was stored away many years ago in a very old and very small building on the Amsterdam Kalverstraat – a man sits at a very large desk. This man speaks, commands or understands the following languages: Dutch, French, German, English, Spanish, Italian, Portuguese, Hungarian, Polish, Czechoslovakian, Danish, Norwegian, Swedish and Serbo-Croatian. He is, moreover, a physician and has rather more than a rough knowledge of the medical specialisms that are brought to his attention day after day. "l'Ospedale" lies open before him. It is one of the 1,800 journals he sets eyes on, and of which, at the very least, he reads the article headings. Dr. Vizioli's story is on page 117. "Damage to the Brain Tissue and Criminality." The article belongs primarily to Excerpta's monthly magazine "Neurology and Psychiatry," but also to the journal that deals with the medical aspects of public health. These sections are numbered eight and nineteen, respectively. We shall confine ourselves to Section VIII of Neurology and Psychiatry – and this for a good reason. Half the case – even if it is rigorously simplified – is quite complicated enough.

Dr. Vizioli's contribution is cut out, arranged into a convenient whole and sent to a young neurologist-psychiatrist who is the editor of Section VIII. He is the one who decides – practically autonomously – what is to be printed in the September issue of his own small slice of Excerpta. His directive is a simple one. He must print a summarized version of anything and everything that, for any reason whatever, may be important to his readers. He receives "Damage to the Brain Tissue and Criminality" and comes to a decision. Without reading more than a few lines he takes the same stand as Dr. Vizioli. This – for other than purely medical reasons – may be important, and a "referent" must be made of it.

He does not use the term "excerpt" because an excerpt alleges to reproduce in brief

the whole of the article's contents. A "referent" is something else. It merely sums up the facts of texts that are noticeably new or original. Therefore, a referent it is to be.

Sacerdoti

It will be made by someone who knows Italian and who is, moreover, specialized in this particular department of psychiatry and neurology. The editor consults a card index listing 750 physicians, five of whom are interested in the psychiatric aspects of brain injuries. They came to be listed in the card index in the following manner. Long ago, when the organisation of Excerpta Medica was first set up, writers of articles that appeared to be of interest were invited to submit a referent on their publication themselves. In addition, Excerpta asked them if in future they would care to receive articles on the same subject by other authors. Often the physician would reply: "Yes please," because he was interested in this particular branch and it would be a unique opportunity for him to see articles that would otherwise certainly have escaped his notice. That his fee was to consist merely of a 50 per cent. reduction on Excerpta Medica publications mattered very little to him. His remuneration lay in the fact that interesting articles were sent to him for perusal, and that he was moreover forced to study them very thoroughly.
To-day, Excerpta Medica is still meeting its need for new referent writers in the same way.
It is known of Mr. Sacerdoti of Venice that he is interested specifically in the link between damage to the brain and psychiatry. The editor therefore sends him Dr. Vizioli's story and, after a short time, the story and referent are returned. Both are in Italian. He passes them on to the main office on the Kalverstraat, where the referent is to be translated into English. And this is where a new story begins.

Sixty Translators

In this gigantic web of organising expedients and makeshifts the translators play an extremely important role. There are sixty of them in all, ten regular employees and the remainder on a free lance basis. All are proficient in English and one or more languages besides. But this knowledge of English is something different to what is generally meant by the term. The holder of a secondary certificate who, in addition, successfully completed a course at an international school for interpreters, would certainly require a further two years' practical training before he would become an efficient translator with Excerpta Medica. Not only must he know all the existing and newly-formed medical terms in English and at least one other language, he must also learn to understand the personal idiom of any scientific publication.
Obviously the international appreciation of Excerpta Medica depends to a considerable extent upon the quality of its translators. The principal markets are those where English is spoken. In scientific circles the slightest idiomatic error immediately occasions general hilarity. Because of this, whenever Excerpta requires a translator (and it is always requiring translators), only one in twenty applicants turns out to be suitable enough to undergo further training.
But to return once more to the all-important referent, it is now ready in English translation and lies on the editor's desk. For the first time he sets eye on a brief

summary of the article and adapts it in such a way that its essence emerges most clearly. Of the whole report, covering eight type-written lines, three are scratched out. All that remains then is a statement to the effect that a case is described of a seventeen-year-old girl who committed a serious crime, which is assumed to have taken place at a time when her consciousness was lowered, and that a medical examination revealed damage to the cerebral tissue. Full stop. A word to the wise is enough and "Neurology and Psychiatry" is compiled exclusively for the wise.

Still more certainty

But still Dr. Vizioli's story has not passed through all the wheels of the powerful machinery. In order to be wholly sure, the adapted referent is sent to a supervisor – a British physician who concentrates especially on the stylistic side of the matter. And behold. Where the translator wrote "due to a probably very deep," the supervisor takes his red pencil and changes this into: "due probably to a very deep."
The corrected version is returned to the editor once again, who controls whether the red pencil made any changes in the meaning.
An error in the text is considered a calamity at Excerpta Medica. In the first place because to err is unscientific, and secondly because 0.001 grammes instead of 0.01 grammes could well mean the death of a patient. Although pride is taken in the fact that many physicians regard Excerpta as a work of reference, this also brings about its consequences.
Now the text is ready at last for the press. Compositors, correctors, printers and forwarding agents all do their bit, and, on a certain afternoon, the September issue of "Neurology and Psychiatry" makes its appearance on the desk of a doctor at Abadan. He is one of the 2,250 subscribers – one of the very few to have a personal subscription, because, here again, especially the clinics, the research centres and the libraries are the principal customers. He glances through the booklet. The referent sent in by a certain Sacerdoti of Venice of a story by a certain Dr. Vizioli of Rome is the 585th of a total of 739 to appear in this issue. Via the printing process the whole story has shrunk to a little more than four lines.
The simplest proof of the weight these lines may carry at a given moment is the amount of work and time willingly spent on them.

SPACE FLIGHT
Ninth Congress of the I.A.F.

In the last week of August, 1959, the International Astronautical Federation held its ninth congress at the Municipal University of Amsterdam under the auspices of the Nederlandse Vereniging voor Ruimtevaart (Netherlands Society for Space Flight), which was the host society.

The I.A.F., the largest representative body of organised professional interest in astronautics, is composed of 28 national rocket and space flight societies from 24 countries. The total number of individual members of all the societies associated with the I.A.F. is 21,000.

This international federation organises a congress every year to promote and stimulate space flight for peaceful purposes. Both with respect to the number of participants, totalling about 400, and the number of lectures, the ninth congress was the largest ever to be held. This was mainly due to an ever growing interest in space flight, although the central geographical location of the Netherlands was undoubtedly also a contributory cause. The congress was once again attended by many leading space flight authorities from East and West. It was also the first time that Dr. Wernher von Braun was able to be present.

A remarkable feature of the congress was the attendance of a great many technical representatives of large firms interested in rocketry and astronautics in general – most of them from the United States. More and more the annual congress of the I.A.F. is coming to be regarded as an opportunity to gather useful information about new ideas that can be applied in the technical development of space rockets and astronautical instrumentation.

Indeed, viewed objectively, space flight is essentially an international endeavour. The great space flight programme was stipulated by pioneer minds many decades ago. However, this programme embraces so much that more is required for its realization than the industrial capacities of the Great Powers alone. The united scholarship and technical inventiveness of the civilized world must be mobilized. Eminent scientists and engineers of all nations would like to contribute their share and become identified with the evolution of astronautics – this despite the fact that most countries have no financial means at their disposal to realize space rocket launching projects.

In most countries this lack of space vehicles is causing a national frustation – a frustration, human nature being what it is, that could lead to envy and bitterness. The I.A.F., therefore, tries to stimulate work on astronautical subjects through international and national research work by development centres, universities, individual specialists, etc. During the delegate sessions of the Amsterdam congress the following four-point programme of international co-operation was unanimously approved:

1. To collect and disseminate from one focal point all information pertaining to the plans and progress of the space flight research activities of all nations;
2. To establish a significant number of scientific research fellowships in astronautical subjects;
3. To organise an international competition for the selection of a number of research experiments to be conducted on earth satellites;
4. To hold an international conference on the peaceful application of rocket vehicles.

With respect to the latter, a "Rockets for Peace" conference – as was the case at the Geneva "Atoms for Peace" conference – would reveal the many peaceful results and applications to be expected from research on and exploration in space. Both atomic energy and rocket power constitute powerful tools for the destruction of mankind, yet are, at the same time, tools of immense potential for man's understanding of nature and of himself. An international conference on the peaceful application of rocket power would provide an opportunity to further international understanding and co-operation. The I.A.F. would logically be in a position to co-operate and assist greatly in an international conference of this kind.

During the technical sessions of the congress several really significant contributions to space flight problems were made by the United States astronautical industry and a number of universities and individual specialists. Europe was represented as well in the various contributions presented by the universities and individual research workers.

Of the large number of papers, totalling about 75, 37 came from the U.S.A. and 3 from the U.S.S.R. Propulsion systems and propellants constituted the main theme of the lectures programme. The relatively advanced state of the conventional chemical propulsion systems guarantees their prominent position in space programmes for at least another five years. By means of these systems it is already technically possible to realize unmanned space flight throughout the planetary system, using the principle of the multistage rocket. Other more powerful propulsion systems, including the use of free radicals as high-energy propellants and the application of atomic energy, were also discussed in different lectures. These systems are all still in the first inventive stage and are not technically available as yet. The application of atomic energy seems to be most promising. A nuclear reactor can be used to heat a working fluid of low molecular weight, such as hydrogen. The hot fluid can then readily be expanded adiabatically in a Laval nozzle like a chemically heated fluid. Some lectures (by Winterberg and Ackeret) suggested the possibility of applying isothermal expansion in order to avoid too high temperatures in the heating chamber. In this way, using hydrogen as working fluid, it would become theoretically possible for a space vehicle to be freed from the earth's gravitational field in one single stage. With the afore-mentioned propulsion systems a space vehicle can only be placed in some free orbit, after which the vehicle is acted upon solely by gravitational forces. These systems are destined to work but a few minutes, and are not very flexible. Sufficient flexibility can only be obtained by electrical propulsion units in which electrically charged particles are used as propulsion mass (known as ion rockets). In this connection, Dr. Sänger-Bredt gave an excellent summary in her lecture of working fluids. The ordinary chemical propulsion units expel only molecules or atoms. With rising temperatures the gases become more completely dissociated and the atoms are ionized. An ionized gas which behaves as a neutral fluid is called a "plasma." If the ion density is low the plasma behaves as a dielectric, and if the ion density is high the plasma becomes a conductor. If, on the contrary, we are dealing with a stream of charged particles consisting of two beams of isolated positive and negative particles, charged gaseous substances are involved, of which the ion beam containing the heavy particles can be used as a propellant. The ion beams are then accelerated by electrostatic fields. In order to keep the vehicle neutral, the charge of the expelled negative particles will have to be numerically

equal to the charge of the expelled positive particles. Of course, any build up of a charge of the space ship as a whole would soon stop the whole process of electrostatic acceleration. Until the time of this congress, only the ion rocket using electrostatic acceleration was considered in detail. This working system has the disadvantage that particles of opposite charge are accelerated in opposite directions by the same electrostatic potential. Now any charged particle moving in a stationary magnetic field will be acted upon by a Lorenz force which is still perpendicular to the speed of the particle, so that only the direction of motion varies and the numerical value of the speed remains constant. However, if the magnetic field travels as a whole, the charged particle can be accelerated in the direction of travel of the magnetic wave and the resultant acceleration of positive and negative particles will be in the same sense.

This principle of electromagnetic acceleration of a plasma, first advanced by Dutch astronomers (Professor Oort) as a working hypothesis to explain the coming into being of cosmic radiations, is now generally proposed as the propulsion system for electrical space ships, and, in general, is considered very promising. This subject was specifically dealt with in Professor von Karman's inaugural lecture and in a thorough study by Bostick. With these electrical propulsion systems (both by electrostatic and electromagnetic means), exhaust speeds in the order of magnitude of 100 km/sec can easily be attained, so that, at the outset of the deep space journey, these systems require only a low mass ratio, that is, a small percentage of the stored propellent mass in comparison to the total mass of the space ship. On the other hand, the thrusts which can be technically obtained in this way are very low, so that only small space vehicle accelerations can be achieved. Hence, these electrical propulsion systems can only be applied to space ships which must be composed of structural components placed into a Keplerian orbit about the earth by conventional chemical rockets, or, at a later stage of development, by atomic rockets.

For the rest, the main difficulty adherent to electrical propulsion systems is the total electrical equipment required to generate the electrical or electromagnetic field. In some way futural development must be such that the fluid of the expelled mass is used simultaneously as generator fluid. As Shepherd emphasized in his lecture, proposals advanced in this connection are all highly speculative.

The problem of guidance and control was also examined in different lectures. Guidance and control are among the most basic technical fields of astronautics, being generally considered second in importance only to propulsion. In a study by Lopes Cardozo and De Kler on automation for interplanetary navigation, it was found to be feasible for a space ship to carry electro-mechanical computing apparatus combined with observation equipment to obtain the necessary data to determine the space ship's spatial position. It was proposed to use an analogous computer with closed loop systems for orbit computing and determining the nearest approximation to the target planet.

The various gravitational forces of the celestial bodies coming into play are introduced into the calculating system, while simplifying conditions are made. Eventually the ship's own thrust can also be continually recorded to determine the components of the total accelerations in three spatially fixed directions. In an equivalent system, Stearns described a similar arrangement, including a celestial triangulation system, a thrust reference system, a spherical triangle computer and a navigation command

computer. These studies on the astronautical navigation problem relate to a more advanced future when manned space flight will be brought to realization. A problem of the more immediate future is the radio guidance of an unmanned deep space rocket by a terrestrial station. Kooy discussed a possible guidance and control system for launching a multistep rocket with the accompanying orbital computations. The steering servomotors of each step can be radio commanded from the earth according to a time programme, whereas the disconnection of each step and the engagement of the propulsion system of the following step occur independently of the terrestrial control station. For a further supervision of the powered flight, suitable information can be transmitted by telemeter from the rocket to the command station, where the reported and programmed data is then compared. In the event of deviation, corrective measurements are mechanically computed and transmitted directly to the rocket by telemeter.

A most interesting and stimulating article on impulse mid-course correction of a lunar shot carried out by the I.B.M. computer was submitted by Klemperer, Hunter and Gunkel of the Douglas Aircraft Works. In order to reach lunar distance, the initial speed of the free trajectory, hence at the burn out of the last step still in the earth's vicinity, is very near to the parabolic speed, so that any slight variation in speed has an enormous influence on the range and flight time. Therefore, in order to meet the difficulties of accurate time programming, a mid-course correction is advanced. Repeated calculations indicated how initial conditions can be chosen in the best way.

A similar computation and research programme on astronautical orbit calculation, using a digital computer, was recently undertaken in the Netherlands.

The very urgent questions of space law were dealt with at length at a special colloquy organised by Mr. Haley, president of the I.A.F., who is himself one of the leading authorities in this special province. The following resolutions were unanimously adopted by the colloquy:

1. To settle the legal problems arising from the development of astronautics through a new international convention;
2. To create within the framework ofthe Federation a Legal Permanent Committee, open to lawyers of the various societies or groups affiliated with the Federation, the members of which are to be entrusted with the study of all problems pertaining to the law of space to be included in the convention mentioned under 1.;
3. To communicate the above resolutions to the Secretary General of the United Nations Organisation, who must be ensured of the Federation's desire to cooperate in any initiative to be taken by U.N.O. in the field of astronautics.

Summarizing, we may conclude that this Amsterdam congress of the I.A.F. has been a fertile one. The proceedings of the congress, comprising most of the technical lectures, are to be printed by Springer Verlag A.G., Vienna, and will appear early in 1959.

J. M. J. Kooy [1])

[1] Dr. Kooy is lecturer at the Royal Military Academy of Breda and President of the Nederlandse Vereniging voor Ruimtevaart (Netherlands Society for Space Flight).

CHRONICLE

UNIVERSITY NEWS

Nymegen University Celebrates its Seventh Lustrum

The 35th anniversary was celebrated on November 10, 1958, of the Roman Catholic University at Nymegen. By Royal Decree of October 9, 1923 – which has since undergone several modifications – the St. Radboud Foundation at Utrecht was empowered to establish a private university which, in regard to its conferment of certain doctoral degrees and its issue of references, was to have equal rights as the State universities. The Senate added lustre to the celebrations by conferring three honorary doctorates. Father Maximilianus (P. J. van Gun) became honorary doctor of literature and philosophy; Professor R. Savatier of the University of Poitiers became honorary doctor of law, and Dr. Anna Tengel of Philadelphia became honorary doctor of social medicine. The simultaneous award of three doctorates was an event of primary importance in view of the fact that only seven honorary doctorates have been granted during the 35 years of the university's existence.

The dies address by Professor Dr. G. W. Groeneveld was entitled: "Labour and Capital in the Machine Age." Professor Groeneveld stated that the rise in prosperity has proved to be a consequence of the collaboration between capital and labour. But, he said, science and the achievements in the technical field are causing a displacement – especially in a century characterized by the technocracy of modern trade and industry and a second industrial revolution, in which machines are even taking over man's intellectual and other functions.

In most cases mechanization and automation also mean the substitution of human labour by machinery. Round this expulsion process unrest is now growing within the trade unions. The memory of the unemployment of the 'thirties' plays an inportant role in this unrest. Since then, however, liberalism has turned towards the modern, active welfare policy and the welfare state. For this reason the atmosphere within which the modern economic and technical process is brought to completion is of a fundamentally different nature. Yet for Western Europe, within whose boundaries the imports and exports of unemployment will in future take place, unemployment remains a source of anxiety, and a solution to this problem therefore necessitates international co-operation and consultations.

This does not alter the fact that the Netherlands must not fall behind in a technical respect. In the past the Dutch entrepreneur, notwithstanding heavy financial burdens, understood and carried out this task. The capital needed for investments he derived primarily from the business profits he had saved himself. This process will be furthered by mechanization and automation.

Through this development the pursuit of gain has become less and less a matter of personal profit making. It must be prevented, of course, that this less personal pursuit of profit is regarded as a procedure to which personal joy may no longer be attached, and which no longer really belongs in a modern social economy. Nor should the Revenue be allowed in its levies to overstep reasonable bounds – and this specifically in the interest of the community.

After pointing out that the entrepreneur should guard against degeneration and dehumanization to that one factor: management, Professor Groeneveld established that the activities of the present entrepeneur, which are combined with a growing social consciousness as well as the development of a national economic policy, offer sufficient guarantees to lead and direct labour and capital in such a way in this machine age, that not only the economic prosperity but the social welfare also are served thereby.

Following this address the honorary doctorates were presented. Pater Maximilianus for whom Professor Dr. L. C. Michels acted as promotor, received the distinction in recognition of his great services for the study of the history of Netherlands and Western European literature and for his study on the relations between Latin and Netherlands literature. Professor Dr. W. van der Grinten was the promotor of Professor Savatier. The honorary doctorate was conferred on the French jurist for his scholarly publications on the science of law. Dr. Anna Tengel, for

whom Professor Dr. A. Merten acted as promotor, was honoured by the Nymegen University as the founder of the order of medical mission sisters, an order comprising five hundred nuns who carry out their work all over the world. Dr. Tengel, who was born in Tyrol, is now Mother Superior of the order at Philadelphia.

Ninth Lustrum of the Netherlands School of Economics

On Saturday, November 8, 1913, the Netherlands School of Commerce was opened in the large hall of the Harmony Society at Rotterdam. At that time three professors, eleven part-time professors and six lecturers had been appointed, and sixty students had enrolled.

As at first the school owned no building of its own, lectures had to be given in different premises. To meet this difficult situation it was decided in 1915 to build an institute. The building duly arose on the Pieter de Hoochweg, corner Westzeedijk, and opened its doors on August 1, 1916.

A long time elapsed before the school was finally accorded legal recognition. In fact, it was not until April 22, 1937, that a law was published in the State Gazette to the effect that the school of economic sciences would thenceforth have the same legal status as the other universities and colleges already in existence. In 1938 its name was changed to Netherlands School of Economics. Not only did it experience a remarkable growth – more than 1,500 students were enrolled in 1958 – but there was also an important development in regard to its curriculum and study facilities.

On Saturday, November 8, 1958, the official celebrations of the ninth lustrum commenced with a formal session of the Senate in the auditorium. On this occasion Professor H. W. Lambers, the Rector Magnificus, delivered an address entitled: "Institutionalism in the Economic Process."

As starting point the rector took the statement by the late Professor Dr. F. de Vries during a New Year's address in 1958 for the Social Economic Council, about the swift change in the institutional principles of the present-day economic process. The conclusion to be drawn from this was that a fixed point for the application of economic trains of thought would therefore escape us. Speaker did not want to deny this, but warned against taking the statement agnostically – in the sense that theoretical economics would no longer be able to provide any answers at all. The task is partly shifted because it becomes necessary to examine which causes dominate the forming of economic institutions.

The institutional market is characterized by the fact that in virtue of certain aims ties are imposed on the conduct of consumers and producers. In a mixed economic order these ties can come from two sides, from the consumers and producers themselves and from the authorities. The first tie, referred to by the speaker as internal institutionalism, rests upon the impersonal undertaking's striving towards continuity. It finds its terminal point when the authorities recognise the private market agreements – described by Professor Lambers as the "golden umbrella," the ideal protection, of institutionalism.

At the same time, however, the authorities, as bearers of the responsibility for the general interest, begin to impose certain ties on the market. Major examples thereof now also lie in the international field, such as the European Coal and Steel Community and the European Economic Community. This external tie, arising partly to counterbalance the intervention in the spontaneous market by consumers and producers, leads to a new uncertainty for the entrepreneurs, namely, the institutional uncertainty. This, in turn, calls forth attempts to tie the market conduct emanating from the consumers and producers. This process of self-culmination is accelerated by the fact that the institutional bodies, once they have arisen, wish to extend themselves.

Professor Lambers came to the following conclusion: "We shall have to have the courage to recognise that economic life is not a drawing board, that theoretical economy is not a blueprint reflecting the construction inch by inch. Economy does its duty if it traces general coherences with such a degree of reality that in inserting the aims it can indicate tolerances within which these aims still work dynamically."

Professor Lambers ended his speech by saying that the future of the Netherlands School of Economics and the economic structure of the country are secure as long as men of vision remain in charge. "Such a man is now present," the rector said, "in the person of Mr. K. P. van der Mandele, to whom the School wishes to pay homage by conferring on him an honorary doctorate. The Royal Decree to this effect was signed just two hours ago." This announcement was loudly applauded.

After speeches were made by representatives of the student organisations, all those con-

nected with the School were received by the municipal authority in the town hall, where Burgomaster G. E. van Walsum addressed Rector and President-curator.
On the occasion of this ninth lustrum the Netherlands School of Economics has organised an impressive exhibition under the name of "Europoort" (Eurogate).

117th Dies of Technological University-Honorary Doctorate for Sir John Cockroft

On the occasion of the 117th dies of the Technological University at Delft, a formal public session of the Senate took place on January 10, 1959, in the Westerkerk (West Church) at Delft. Professor R. Roelofs, Vice Chancellor and Senate secretary delivered an address on the subject of „Intercontinental Bridges" in which he referred to the discrepancy between existing charts and maps and the prevalent system of radio co-ordinates.
Following this dies speech an honorary degree of doctor of technical sciences was conferred on Sir John D. Cockroft, the physicist and Nobel Prize winner and holder since 1956 of the Lord Kevin gold medal.
The promotor, Professor Dr. R. Kronig, called to mind that Sir John, as a brilliant pupil of Lord Rutherford, had occasion early in life to use his technical ability and knowledge for the solution of physical problems. In the Cavendish laboratory Sir John had constructed technical apparatus for conducting experiments on the diversion of swift particles as well as machinery for the generation of very strong magnetic fields. Lord Rutherford had subsequently entrusted him with the task of developing a high tension plant.
Sir John's researches in the field of nuclear fission, in pursuance of Lord Rutherford's initial experiment of 1919, constitute a milestone on the road of nuclear physics. The award of the Nobel Prize for Physics in 1951 had set a well-deserved crown on his work. Professor Kronig said in conclusion that Sir John had been a welcome guest in the Netherlands on several occasions.
In reply, Sir John gave thanks for the honour extended to him. He was gratified that a growing interest is displayed in England for technical courses. For years little had been done about this but now the situation had changed. We are faced with a number of new developments, he said, such as the physics of low temperatures and controlled nuclear fission. He ended by saying that the co-operation between British and Dutch physicists had always been good.

Tibetan Texts bought for Leyden University

A subsidy was granted by the Netherlands Organisation for Pure Scientific Research to Professor Dr. J. W. de Jong, professor of Buddhism and Tibetan in the State University at Leyden, to purchase in behalf of the university library a collection of Tibetan texts which were published in Japan.
In an interview with the Dutch Press Agency A.N.P., Professor De Jong stated that these texts are of great importance for the study of Buddhism. In India, its country of origin, Buddhism led to a great flow of literature, the greater part of which was lost when Buddhism disappeared from the country. Fortunately, however, a large number of texts were translated into Tibetan between the 8th and the 17th centuries.
Tibetan scholars assembled these translations into two large collections, namely, the Kandjur and the Tandjur. The Kandjur was first printed in Peking in 1410 by means of wooden blocks, as was customary in China at the time. Since then, both Kandjur and Tandjur have frequently been printed in Peking and Tibet. With respect to the clearness of the print, one of the best editions is that which was printed in Peking between 1700 and 1724. The wooden blocks of this edition were burned during the Boxer uprising of 1900.
In Japan, where Buddhism is intensively studied, this edition was recently reprinted by photolithography. Whereas the original consisted of 333 parts, by reducing the format it has now been reproduced into 151 parts containing more than 4,500 separate texts.
The majority of these texts relate to Buddhism, though some of the works, written in India, are on grammar, the theory of the art of poetry, logic, chronology, medicine, etc.
Through the purchase of this photolithographic reprint Leyden now offers facilities for the study of these numerous texts, only very few of which have thus far been published and printed.

Towards a Rotterdam University?

The Rotterdam Commission for Higher Education, which was called to life in 1956 by the municipal authority, submitted a report on January 20, 1958, on the question whether a university should and could be founded in Rotterdam.
The Commission expressed the opinion that, in view of the rapidly increasing student

population of the Netherlands – which is expected to number 56,000 by 1970 – the foundation of a new, medium-sized university is certainly justifiable. This university would have to be erected in Rotterdam. On the one hand because the absence of a university has always been keenly felt in this city – the second port in the world – and on the other hand because a university could come to play an important cultural role with respect to the islands of South Holland and Zeeland and West Brabant when these territories are opened up by the Delta plan.

If a new university is established, it will not necessarily be strictly tied to the well-known pattern of traditional faculties, although it will never be able to get away from this pattern altogether. The Commission believes that the university should be guided by the national need for certain types of training, while, moreover, new forms of instruction would have to be sought that elude the frame of the traditional faculties.

Thus the institution is recommended of a literary faculty to include a number of modern languages, whereas the Slavic, Oriental and other non-European languages could be dispensed with. The faculty of mathematics and physics would, of course, have to include physics and chemistry but there would be less need for geology and pharmacy. Instruction in dental surgery is considered highly desirable in view of the great shortage of dentists. With respect to theology, the Commission advances an idea that is entirely new for the Netherlands, namely, that a Protestant and a Roman Catholic theological faculty be founded alongside each other, as is already customary, for instance, at various German universities.

The Commission is of the opinion that attention should be paid to the following new forms of instruction:

1. an initial course of training whereby the spiritual sciences, the exact sciences and the social sciences are taught on a parallel level;
2. a four-year course of training whereby emphasis is laid during the first part on a general tuition, while during the second part a main subject is chosen for further training, to constitute either the final training or the preparatory training for further study;
3. a course of training in co-operation with the Technological University at Delft and based on the B. (beta) subjects, of a theoretical as well as an applied character.

The Commission believes that it will not be a simple matter to draw lecturers to the university but that, nevertheless enough capable teachers are to be found in the Netherlands to occupy the various chairs.

It attaches great importance to a close collaboration with the Netherlands School of Economics, the board of governors of which happily takes a positive stand in regard to the plans for a university.

Now that the Foundation for Clinical Higher Education has acquired the official status of collateral faculty of the State Universities of Leyden and Utrecht, the question whether a complete medical faculty should be instituted in Rotterdam ought to be given further consideration.

The State Tax Academy at Rotterdam could probably be fitted into the general scheme, and instruction at this institution could be set on a university basis. Efforts should be directed wherever possible towards a close co-operation with the Technological University at Delft, particularly in the field of mathematical and physical subjects.

In regard to the financial side of the matter, the Commission remarks that although the Rotterdam municipality is prepared to make a substantial contribution, the support of the State will nevertheless prove necessary. It believes, however, that the financing of the project will not present any insuperable difficulties.

A minority note is attached to the report, signed by three professors of Delft, Leyden and Utrecht, respectively. Their principal objection is directed against the Commission's ideas relating to specialization and concentration on national requirements. The aforesaid professors are of the opinion that the completeness of the traditional university cannot be renounced without danger, and that the Commission has regarded the future institution too much as an aggregation of special training courses.

Laboratory for Microbiology at Delft

On November 18, 1958, the Technological University at Delft was enriched with a laboratory for microbiology, which was opened in the presence of several professors and students from different universities and schools, and representatives of the Netherlands industries. This laboratory, in fact, is also at the disposal of students from other institutions of higher education who want to carry out more intensive research work.

The industry will also be able to avail itself of this opportunity for advanced research work. Furthermore, biologists, chemists and pharmacists from other countries will be in

a position to work in the Delft laboratory to complete their researches. The laboratory houses an electron microscopy section and a fermentation section of the Central Bureau for Mould Cultures.
In 1897, the Delft Technological University was the first institution of higher education to introduce microbiology in its curriculum. With this new laboratory it can now compete with similar institutions in other countries. Before the opening took place a bust was unveiled of the late Professor A. J. de Kluyver, who was professor at the Technological University from 1921 tot 1956. He not only greatly stimulated biological research in the Netherlands but made it widely known abroad as well.
The opening speech was made by Professor Dr. O. Bottema, Rector Magnificus of the University. The original microscope of Antonie van Leeuwenhoek was placed in the new laboratory.

Four New Laboratories at Delft

The block of buildings of the Technological University at Delft is constantly expanding and new laboratories are continually being put into service on the premises. On January 9, 1959, four laboratories were opened, namely, one for chemical instruments, one for cold technique, one for vehicle technique, and one for tool parts. A laboratory for textile technique is to be opened shortly, while laboratories for aerodynamics, hydrodynamics, lifting tackle and internal combustion engines are under construction.
In his opening speech, Professor Ir. R. van Hasselt expressed his conviction that the Dutch engineering industry is capable of producing new high standard constructions and its own designs. The capacity of a laboratory, on the other hand, is determined by the professor or professors on its staff, because it was impossible, in his opinion, to cope with more than ten students per year per chair in the final study.

Italian Language and Literature Institute at Utrecht

The official opening took place on November 11, 1958, of the Italian Language and Literature Institute of the State University at Utrecht. Its semi-official existence began in 1955, in a small room which had kindly been lent by the French Institute to the then newly appointed lecturer in Italian, Dr. Maria H. J. Fermin. Dr. Fermin was appointed part-time professor on July 1, 1958, and will take up her duties on February 23rd of this year. In view of the fact that her lectures are attended by about one hundred students, the curators decided to provide her with an institute of her own on the Zuilenstraat, and a scientific senior official was appointed at the same time.
The library of the late Professor Guarnieri was bought on behalf of the institute in 1955, and Professor Fermin is so busy at present collecting all sorts of Italian art objects, such as paintings and glassware, for the institute, that her enthusiasm has earned her the name of "signorina dynamica" at the Italian Embassy.

INSTITUTIONS

Centenary of the Utrecht Eye Hospital

The hundredth anniversary of the Netherlands infirmary for indigent and less prosperous eye patients was celebrated in Utrecht on November 6, 1958. At a meeting in the hospital the first presentation was made with a certain amount of ceremony of the Dr. H. Snellen medal, designed by the sculptor Joop Hekman. The recipients, six eminent oculists who were attached to the hospital for shorter or longer periods, were: Professor Dr. G. F. Rochet, former professor at Groningen; Professor Dr. W. P. C. Zeeman, former professor at Amsterdam and preceptor of Professor Dr. Weve, the former director; Dr. C. O. Roelofs at Amsterdam, former secretary of the Ophthalmological Society; Professor A. Mulock Houwer, former professor at Batavia; Dr. P. Waardenburg at Arnhem; and Dr. G. ten Doeschate at Utrecht, father op the present director of the Eye Hospital, Professor Dr. J. ten Doeschate. Henceforth it is intended to award a medal to a deserving Netherlands oculist at each lustrum.

The celebrations culminated in a commemorative meeting in the auditorium of the State University at Utrecht, which was attended by H.M. the Queen. On this occasion the first speaker was Professor Dr. J. ten Doeschate, who described the hospital as an exception in the university community: a private institution, founded on the principle of charity, whose aim it is to

serve higher education. The next speaker was Professor Dr. H. J. M. Weve, who sketched the Eye Hospital's history, rendering special homage to his two predecessors, Professor Donders and Dr. Snellen. After various authorities and professors had also spoken, a recently published book by Dr. G. ten Doeschate on Professor Donders, was presented to the Queen.

Before the two commemorative ceremonies took place a wreath had been laid at the foot of the monument to Professor Donders in the Janskerkhof (cemetery).

Professor Donders, who lived from 1818 to 1889, and was the founder of the Eye Hospital, became an oculist more or less by chance. Destined at first to become a priest, he came to the science of medicine via a military training as army doctor. He was especially interested in physiology, and had already acquired a world reputation in this field when, in London in 1851, he met the Englishman Sir William Bowman, renowned for his researches in the field of ophthalmology, and the German oculist Albrecht von Graefe, who had already founded a clinic for eye patients in Berlin. It was from them that he learned about the Helmholtz ophthalmoscope, an instrument for viewing the interior of the eye. Upon his return to Utrecht, Donders established himself as an oculist. Requesting Helmholtz to send him an ophthalmoscope, he meanwhile instructed an Amsterdam instrument maker to make an ophthalmoscope which proved to be even better than the instrument from Germany when the latter eventually arrived. Donders started a clinic for the needy at his own expense, but as there were no facilities for nursing his patients, the Utrecht Municipality offered him the use of the so-called "cholera hospital." In 1858, he was enabled by private gifts and donations to purchase and convert the adjoining premises. Thus the Netherlands infirmary for indigent and less prosperous eye patients came into being on the Wijdebegijnhof.

Not only was it the first eye clinic in the Netherlands, it was also one of the first in the world, and before long patients came flocking to Utrecht from all parts of the Netherlands, but also from far beyond the country borders.

In fact, at one time the Emperor and Empress of Brazil sat in the clinic waiting room. So engrossed did Donders become in his practice that he turned down an honourable offer by the Medical Faculty of Bonn to succeed the famous Helmholtz.

In a certain sense, the history of the Utrecht Eye Hospital is also the history of ophthalmology. The assistants and successors to Donders helped to build up the hospital's world reputation. Dr. H. Snellen, from whom the Snellen medal derives its name, was not only a capable surgeon, he was also the designer of the letter prints that are still used everywhere to-day, whereby the findings obtained in different places could be mutually compared. His invention was based on the knowledge that a person can distinguish two points as separate if the distance between these points is at least one span minute in the visual field.

A particular worth noting is the fact that the first operation with local anaesthesia was performed in the Utrecht "eye home" at the time when Dr. Kröller was on the staff. He was the scientist who, through the application of cocaine, introduced local anaesthesia into medicine.

When Professor Weve took up this duties in 1929, this coincided with an event of the utmost importance in the profession, namely, the discovery by the Swiss oculist J. Gonin of the correction of the *ablatio retinae* (retinal ablation), which was later discussed at an international congress in Amsterdam. Professor Weve devoted himself wholeheartedly to this technique, with the result that the Utrecht institute has retained its great reputation. In the last quarter of a century more than 5,000 patients were treated at the clinic for this affliction, 90 per cent. of the cases meeting with succes.

The Eye Hospital now runs a department for contact lenses which may bring relief to patients if spectacles fail. An important part of its current activities consists of "training" bad eyes. By this method children with casts in their eyes can acquire normal eyes through constant exercises with stereoscopes. Another important development in modern eye surgery is the transplantation of the cornea.

In the hundred years of its existence a total of 608,921 patients were treated at the polyclinic, 67,772 of whom were nursed in the infirmary, to a total of 1,492,450 nursing days. During this period 63,230 major operations were performed.

The influence of this Utrecht centre for ophthalmology can be judged from the fact that the index of the blind in the Netherlands is the lowest in the world. For this the country is especially indebted to that great man Donders, through whose untiring efforts a professor of ophthalmology was appointed at every university in the Netherlands. These, in turn, taught many able pupils, who were

subsequently active in founding clinics in other centres, such as The Hague, Rotterdam, Maastricht, Arnhem and Nymegen. The oldest Eye Hospital in the Netherlands therefore had every reason to celebrate its centenary with pride.

The Medical Excerpt: a Netherlands Institution

"EXCERPTA MEDICA" is the largest organisation in the world to concern itself with the collection and publication of scientific excerpts in the medical field. This Netherlands institution subscribes to approximately 1,800 medical journals appearing in about fifty languages. Together they present almost a complete picture of the state and development of the medical sciences. Articles from these journals are sent to 8,000 specialized contributors all over the world, who make the excerpts.

Excerpta Medica is divided according to specialisms into twenty sections, which appear separately once a month in the form of a booklet written in English. The total number of copies of these twenty sections is more than 20,000. Readers can subscribe to one section only. In view of the fact that more than 80 per cent, of the subscribers are clinics, research centres and libraries, it can be stated without reservation that all specialists, in whichever part of the world they may be carrying out their important work, can regularly consult the Excerpta Medica of "their" particular section.

This organisation is the ultimate outcome of discussions which took place during the Second World War between Professor M. W. Woerdeman, Rector Magnificus of the Municipal University of Amsterdam, and other professors. He found support for his ideas among a small group of Amsterdam publishers. It was known that the medical world was in urgent need of an excerpt service – universal and specialized at the same time.

The principal branches of the science of medicine were classified into fifteen sections, which were to appear separately once a month in pocket edition. In 1947, the first fifteen numbers of the first year of publication duly appeared. Since then the science of medicine has expanded considerably both in breadth and in depth. In consequence, a new section was founded every time the financial position of Excerpta Medica was particularly flourishing thanks to subsidies (especially from the United States) and remuneration for documentation and translation work placed with the organisation. At the present time there are excerpt services in twenty specialistic and supra-specialistic fields.

The ultimate responsibility for the editorial management of all sections combined rests with a committee of three editors-in-chief, of whom Professor M. W. Woerdeman is chairman. Mr. E. van Tongeren is director of the head office at Amsterdam and Mr. P. Warren is director of the New York office.

INTERNATIONAL COURSES

International Meeting on Methods and Programme Planning in Agricultural and Home Economics Extension

The international meetings on Methods and Programme Planning in Agricultural and Home Economics Extension, annually organised by the International Agricultural Centre at Wageningen, The Netherlands, under the auspices of the Netherlands Ministry of Agriculture, Fisheries and Food, the State Agricultural University, F.A.O. and O.E.E.C., have, since 1953, been visited by about 600 participants from 58 countries. A seventh international meeting on this subject is to be held at Wageningen, July 6–31, 1959. The meeting is designed both for junior and senior advisory officers and educationalists in agriculture and rural home economics. Experts from various countries, including officials of F.A.O. and O.E.E.C., will be invited to present lectures.

Ample time will be provided for free and frank discussion. A special feature of the 1959 meeting will be the introduction of workshops covering farm management, home management, mass methods and programme planning, which will be guided by experts in the respective fields.

Practical demonstrations, visits to agricultural and rural institutes, field trips, covering a large area of the Netherlands, and a decentralized three-day field demon-

stration period under the personal guidance of district advisory officers, are included in the programme.

Languages: Papers will be presented in English, French or German. A simultaneous interpretation system will enable participants to follow the lectures and take part in discussions in any one of the three languages.

Fee: Total fees will amount to Dfl. 780.—, being approximately US $ 206.— or £ 74/—/—. This amount includes administration fee; board and lodging at Wageningen and during field trips; transport charges during field trips and local visits; programmes, papers and similar publications.

Information: The Secretary, International Agricultural Centre, 1, Generaal Foulkesweg, Wageningen, the Netherlands.

INTERNATIONAL SCIENTIFIC MEETINGS

First International Seminar on Urban Renewal held in The Hague 22–29 August 1958

Cities in all parts of the world are faced with the combined problems of trying to accommodate an ever increasing population and at the same time attempting to rebuild or rehabilitate the older and obsolete portions of the community. The redevelopment of old crowded areas usually results in the reduction of densities - which adds to the problem of providing accommodation. The complexities and difficulties in endeavouring to renew the older sections of urban areas, with the social, economic, and political problems related thereto, is a matter of growing importance.

In order to exchange ideas and experiences between public officials and professional experts in the field of renewal, an international conference was proposed and supported by many organisations. The major financial contributor, which made the meeting possible, was the Ford Foundation. The International Federation for Housing and Town Planning, and the Netherlands Housing and Town Planning Institute, were co-sponsors of the programme.

This International Seminar on Urban Renewal was held in the Old Royal Palace in The Hague from the 22nd to the 29th of August, 1958. Thirty-two participants from twenty countries, and the United Nations, attended, and participation was exclusively by invitation. The success of this type of "summit-level" professional meeting has been acclaimed by all of those attending.

The programme was truly international in character, participants coming from countries of both North and South America and most of the countries of Europe, including Poland and Yugoslavia.

The eight-day programme comprised eight working sessions. Eight prepared papers were presented, and some sixty country and city reports of national and local renewal programmes were submitted, duplicated, and distributed to the participants before the meeting. The working sessions were supplemented with inspection field tours of The Hague, Amsterdam, Rotterdam and Vlaardingen; and official receptions or dinners were given by the Dutch Government and the several cities visited.

The principal topics for discussion during the Seminar were: "Renewal Within the Dynamics of Urbanism" (with paper by Mr. Stanley H. Pickett of Ottawa, Canada); "Land Use and Circulation in Relation to Areas for Renewal Action" (with papers by Messrs. John L. Becket of Leicester, Great Britain, and Sven Lundberg of Stockholm, Sweden); "Area Appraisal and Selection" (with papers by Messrs. Claude H. Boistiere of Paris, France and Erik Rolfsen of Oslo, Norway); "Developing Proposals" (with papers by Messrs. C. van Traa of Rotterdam, the Netherlands, and James H. Scheuer of New York City, U.S.A.); "Effectuation of Renewal Programmes" (with paper by Mr. J. Paton Watson of Plymouth, Great Britain)

The Moderator of all working sessions was Mr. Hugh R. Pomeroy, Adjunct Professor of Planning, Columbia University, New York City, and Director of the Westchester County (New York) Department of Planning, an internationally known authority in the fields of planning, housing and urban renewal. The success of the conference was due in large measure to the effective leadership of the Moderator.

His Excellency A. A. M. Struycken, Deputy Prime Minister of the Netherlands, gave the address of welcome, and introductory speeches were delivered by Dr. F. Bakker Schut, General Director of the Reconstruction and Town Planning Department of

The Hague, and Mr. Richard L. Steiner, Urban Renewal Commissioner of the United States of America.
The majority of the more than thirty conclusions were expressed in part in the prepared papers, and in part developed in the course of the discussions. The conclusions are sufficiently broad and fundamental to be applicable to cities in nearly all countries.
A rather complete record of the proceedings of the Seminar sessions as well as the presentation of about sixty country and city reports of national and local renewal programmes wil be published in one volume which is edited by the Programme Director, Professor J. Marshall Miller. The report will appear under the title "New Life for Cities Around the World: International Handbook on Urban Renewal," and will be published and distributed by Books International through their representative in the Netherlands, W. P. van Stockum & Son, Ltd., in The Hague.

J. MARSHALL MILLER[1]

[1] J. Marshall Miller is Associate Professor of Planning, School of Architecture, Columbia University, New York City.

International Congress on Building in Rotterdam

On the occasion of its third General Assembly in 1959, the International Council for Building Research, Studies and Documentation (C.I.B.), will organise an international Congress open to C.I.B. members and their representatives, as well as to other interested experts.
The principal object of the Congress will be to widen the horizon of experts by presenting to them important building research and building documentation problems and results.
The subjects relative to theoretical and applied building research, documentation, and to the transmission of knowledge, will be introduced by leading experts from various countries. Attention will be given to some special aspects of building in tropical countries.
The Congress will be held at Rotterdam, the Netherlands, from 21–25th September 1959 incl.
The provisional programme contains lectures e.g. by Professor E. Torroja of Spain on "Design and Calculation;" by Mr. P. Chombart de Lauwe of France on "Sociological and Functional Aspects of House Design;" by Professor G. Ciribini of Italy on "Normalisation of Dimensioning on the Building Site;" by Professor G. Kutznetsow of the USSR on "Research Problems concerning Heavy Concrete Elements;" by G. A. Atkinson of the U.K. on "Mass Housing in Rapidly Developing Tropical Areas;" by Mr. L. M. Giertz of Sweden on "Fundamental Aspects of Transmission of Knowledge" etc.

Participation fees, to be paid in advance, are as follows:
for C.I.B. members and their representatives:
Sw.frs. 100.— per person
for non-C.I.B. members:
Sw.frs. 150.— per persoon

Information: Secretariat C.I.B., c/o. Bouwcentrum, P.O. Box 299, Rotterdam, The Netherlands.

International Medical Film Congress

of the International Federation of Medical Student Associations is to be held at Amsterdam from March 31 to April 19, 1959, and will be known as the "International Clinical Film Course."

Information: Clinical Film Course Committee, 327, Keizersgracht, Amsterdam.

International Congress on Production and Use of Compost

organised by the International Agricultural Centre in Wageningen, is to be held at Scheveningen, (The Hague), from April 27 to May 1, 1959.

Information: The Director, International Agricultural Centre, 1, Generaal Foulkesweg, Wageningen.

Annual Congress of the Société d'Histoire du Droit des Pays Flamands, Picards et Wallons

is to be held in Deventer, The Netherlands, in May, 1959.

Information: Dr. A. C. F. Koch, Keeper of Archives and Librarian of the Municipality of Deventer.

3rd World Congress on Fertility and Sterility

of the I.F.A., the International Fertility Association, is to be held in Amsterdam from June 7 to June 13, 1959.

Information: Secretariat, Third World Congress on Fertility and Sterility, 4, Sint Agnietenstraat, Amsterdam, The Netherlands.

Congress of the Société Européenne de Culture

is to be held in Amsterdam from August 24 to 29, 1959.

Information: Dr. W. R. 't Hart, 223, Moerweg, The Hague.

International Congress on Neuro-Biology

is to be held in Amsterdam in the second half of September 1959, by the Netherlands Central Institute for Brain Research, to mark the 50th anniversary of the Institute.

Information: Prof. Dr. S. T. Bok, c/o Nederlands Centraal Instituut voor Hersenonderzoek, 59 b, Mauritskade, Amsterdam.

MISCELLANEOUS

Professor van Asbeck Member of the European Court for the Rights of Man

At a session of the Consultative Assembly of the Council of Europe on January 21, 1959, the members were appointed of the European Court for the Rights of Man. Professor Dr. F. M. Baron van Asbeck, professor of international law and international political history in the State University at Leyden and member of the Permanent Court of Arbitration was nominated member for the Netherlands. Professor van Asbeck is a member of the Board of Directors of NUFFIC.

70th Birthday of Professor van der Pol

Professor Dr. B. van der Pol, who was professor of electrical engineering in the Technological University at Delft from 1938 to 1949, celebrated his seventieth birthday on January 25, 1959. Professor van der Pol, who was director of fundamental radio research with the Philips Company from 1946 tot 1949, and a member of the Radio Council, acquired great international fame in the field of radio engineering and sat in a number of international commissions and organisations.

Since its foundation Professor van der Pol has been a member of the technical committee of the Union Internationale de Radiodiffusion in Brussels. From 1934 to 1950 he was president of the Institute of Radio Engineering at Washington. He has been director of the International Radio Advisory Committee at Geneva since 1949, and honorary chairman of the Union Radio Scientifique Internationale since 1952. The professor has, moreover, written a large number of publications in the field of radio engineering.

65th Birthday of Professor Tenhaeff

On January 18, 1959, Professor Dr. W. H. C. Tenhaeff celebrated his 65th birthday. He was born in Rotterdam in 1894. After completing a course at a secondary school he applied himself for a number of years to the self-taught study of parapsychological phenomena. He subsequently studied psychology, taking his "doctoraal examination" in 1928.

He became a doctor of psychology in 1933 with a dissertation entitled "Paragnosis and 'Einfühlen'." In the course of that year he was appointed external lecturer of parapsychology at the State University at Utrecht. This was followed by his appointment in 1953 as part-time professor in the aforementioned branch of psychology, and his nomination as professor-director of the Parapsychological Institute of the State University at Utrecht, a post which he took up in November 1953.

Professor Tenhaeff, together with Dr. P. A. Dietz, founded the "Journal for Parapsychology" in 1928, later to become the official organ of the Psychical Research Study Society, established in 1919. He was written a large number of articles for this journal. Several of his works have been translated into other languages, and he has gained great renown both at home and abroad through his numerous lectures.

As early as 1926 Professor Tenhaeff started on his important researches on the personality structure of individuals with pronounced paragnostic gifts. In later years he began approaching his subjects from the angle of depth psychology, proving thereby that many paragnostics reveal specializations that are connected with the inborn as well as the acquired personality structure. It is especially these latter researches of the "Utrecht School" which attracted considerable attention in other countries.

In a following issue we hope to publish an article by Professor Tenhaeff on his scientific work and his institute at Utrecht.

Professor of Copyright and Publishers Rights

On November 11, 1958, Dr. E. D. Hirsch Ballin, who was previously scientific senior official with the Juridical Faculty at Leyden, accepted the post of professor of national and international copyright at the University of Amsterdam. This chair was founded on September 18, 1958, on the initiative of the Royal Netherlands Publishers Association.

Professor Hirsch Ballin was born in Wiesbaden in 1899. He graduated from München University in 1924, and subsequently practised as a lawyer and substitute judge. He was suspended from these functions in 1933, sent to Buchenwald a few years later, and banished from his country in 1939. Upon arrival in the Netherlands, where he had many friends and relations, he took an active part in the resistance movement during the occupation. He became a naturalized Dutch subject in 1948.

The newly appointed professor has an exceptionally wide knowledge of copyright and publishers rights. His international publications in this field have earned him international fame.

The History of Music in Antiquity and Middle Ages

On October 19, 1958, Professor Dr. Helène Wagenaar-Nolthenius accepted the post of part-time professor of musical history in the State University at Utrecht.

In her inaugural oration Professor Wagenaar pointed out that the great strides made by Netherlands music since 1400 imply that there must have been some form of musical life before that time. Very little has been found of the music of this earlier period, which has scarcely been studied thus far, but other sources such as chronicles, accounts and literary productions reveal the development of a versatile activity in the Medieval Netherlands.

As an interesting example thereof Professor Wagenaar mentioned a large fragment of a song depicting a market scene in Zeeuws-Vlaanderen. In its musical form the song is pure Italian but the language is Dutch. The close trade relations which existed between Flemish cities and Tuscany doubtlessly played a part in the origin of this compositorially primitive sample of early Netherlands programme music.

Honorary Doctorate of the Sorbonne for Professor Nuboer

During a formal session of the Senate on November 14, 1958, the Université de Paris à la Sorbonne conferred honorary doctorates on ten foreign scholars, including Professor Dr. J. F. Nuboer of the Netherlands, professor of surgery in the State University at Utrecht.

The Dean of the Medical Faculty, Professor Binet, who installed Professor Nuboer as honorary doctor, remarked that his researches and publications in the field of lung surgery and the fight against tuberculosis and cancer had won him international authority. The Faculty had therefore unanimously decided to choose Professor Nuboer, together with his Swedish colleague Professor Liljenstrand, from all representatives of the modern medical sciences for this high distinction.

"A surgeon is a man of the scientific deed," Professor Binet said, "and you, my dear colleague, are a magnificent illustration of this definition, for whom we and the entire scientific world feel the greatest admiration."

Honorary Doctorate of Milan for Professor Dr. Christine Mohrman

In November, 1958, the Catholic University of Milan conferred an honorary degree of doctor of literature and philosophy on Professor Dr. Christine A. E. M. Mohrman, who is professor of Early Christian, Vulgar and Medieval Latin and Early Christian Greek in the Roman Catholic University at Nymegen. She is also part-time professor of Vulgar, Early Christian, Medieval and Late Latin at the University of Amsterdam.

The Milanese University, where Professor Mohrman has given several lectures in the past, awarded her this distinction in recognition of her fertile studies on the Christian civilization of the first centuries and on the history of the Latin language.

Danish Distinction for Danish-Dutch Astronomer

On January 5, 1959, the Ole Roemer medal was awarded to the 85-year-old Danish Professor Ejnar Hertzsprung. This prize was instituted in 1944 by the Copenhagen Municipality in memory of the Danish astronomer Ole Roemer, on the occasion of the three hundredth anniversary of his death.

Professor Hertzsprung was appointed associate director of the Astronomical Observatory at Leyden in 1919, and became part-time professor of astronomy in the State University at Leyden the following year. In 1935 he became director of the Observatory and professor of astronomy at Leyden, a post he held until 1944. Professor Hertzsprung is a member of the Royal Nether-

lands Academy of Sciences and of the Royal Flemish Academy.

South African Language and Culture

On January 8, 1959, Dr. H. van der Merwe Scholtz was appointed professor of the language, literature, culture and history of South Africa at the University of Amsterdam. Professor van der Merwe Scholtz was born in South Africa in 1924. He studied literature there and subsequently at the University of Amsterdam, where he took his doctor's degree in 1950. This was followed by his appointment as senior lecturer at the University of Pretoria.
Since 1955, Professor van der Merwe Scholtz has been a member of the Society of Netherlands Literature at Leyden. As professor at Amsterdam he succeeds his compatriot, Professor Dr. N. P. van Wijk Louw.

Netherlands Ambassador receives South African Honorary Doctorate

On December 12, 1958, on the occasion of "grade day," the University of Stellenbosch conferred an honorary doctorate of philosophy on H. E. J. van den Berg, Netherlands Ambassador to the Union of South Africa.
The distinction was awarded in recognition of Mr. van den Berg's work for the furtherance of Netherlands and South African art, science and culture in particular within the framework of the Netherlands-South African cultural treaty.

Netherlands Historical and Archaeological Institute at Istanbul

At a meeting of the Near East Institute at Leyden on January 29, 1959, H.R.H. the Prince of the Netherlands was installed as curator of the Netherlands Historical and Archaeological Institute at Istanbul. This Institute was officially opened by the Prince on March 31st of last year, when he was on a visit to Turkey (see Vol. II, No. 3, page 30 of this Bulletin).
It was decided during the business part of the meeting to extend the documentation service which was founded by the Institute and relates to the cultural approach, excavations and other subjects concerning the Netherlands and the Near East.
At the same time the board of governors decided to proceed with the preparations for the foundation of a Netherlands centre for the study of Arabic.

BOOK REVIEWS

Bart Landheer, Pause for Transition: An Analysis of the Relation of Man, Mind and Society

ed. Martinus Nijhoff, The Hague, 1957, Pages 284.

In an earlier study (Mind and Society, 1952) the author gave expression to his view that contemporary social sciences were showing an increasing tendency to move away from practical life. This statement he made with great satisfaction. Becoming thus less "ideological," losing gradually "the character of antagonistic systems of philosophy, oversimplifying the findings of the trends they oppose," these sciences might feel induced to follow the example set by the exact sciences since Bacon, and to seek a closer contact with philosophy and epistemology. Should this happen, so the author affirmed, the deep rift traditionally separating the concepts of reality held by either branch of human thought, would soon begin to disappear. And, if it did, there was every reason to expect that the social sciences would ultimately comply with the first requisites for finding a way to clarify the concept of change.
Taking up the same argument anew, Dr. Landheer's recent publication boldly attempts to elaborate further upon its basic implications. No less bold is the ensuing application to western civilization of the theoretical propositions thus arrived at.
The outcome clearly demonstrates that Landheer does not shirk from incurring all the risks involved in the venture of experimental thinking.
Rare indeed are scholars who, in order to gain a survey of the real universe both comprehensive and precise, do not hesitate to climb untrodden paths leading up the high peaks of contemplative theory. However, they unavoidably make a heavy demand upon the preparedness of their readers to follow in their steps.
Landheer is no exception. Certainly his sentences reflect the line of his reasoning extremely well. His language is sharp and to the point. Sometimes – particularly in the three case studies – intending to convey to the reader's imagination what the rational expositions are trying to transmit to his intellect, it becomes light, elegant and colourful: the scholar turns out to be equally a gifted artist of the word.

Yet, where Landheer puts forward his analytical explanations, he is not likely to find an easy response. This is no disadvantage. Only thoughts that are challenging have a chance to bear fruit.

It may be asked i.a. whether it is permissible to bring under the one and same category of "energy" the "bio-chemical, bio-physical, bio-mechanical and bio-electrical processes occurring within the organism" on the one hand, and the manifestations of what we are wont to call "mind" and "spirit" on the other. The numerous question marks and reservations accompanying Landheer's answer scarely weaken the affirmative inference he finally draws. If they had, the inner logic of his entire work would have been irreparably undermined.

The crucial issue at stake remains open just the same. Landheer continues: "The transfer or possible change from one form of energy to another is reflected in our conscious mind, but only – and this seems to be a reasonable though speculative assumption – to the extent that these processes can be influenced by action." "Action," however, presupposes the intervention of the human will.

Whenever this is admitted, at least two problems arise. First there is reason to doubt whether conditions brought about by the workings of the human will can be adequately represented by comments on the concept of energy. With Romano Guardini (Die Macht, 1951), many readers will deem it necessary instead to make use of the concept of power, and to postulate in this fashion that where there is a will there is purpose. Furthermore, they will want to lay stress on man's inborn capability to break through the immediate impact of nature and to dispose of it in freedom. To Landheer "free will" is nothing more than a contributory factor – the original stimulus and influence of the environment being of at least equal importance. Whether interpreting past events or diagnosing institutions, this view will always refuse to conceive of the several instances of relationships engendering power, or engendered by it, as otherwise real than as parts of the ever changing patterns primarily of energy and perhaps of action also.

Secondly, every time the human will is referred to, the controversies regarding the foundation of ethical norms automatically become acute Landheer's observations on this matter, scattered throughout the pages of his book, may not always find ready acceptance. With him ethics constitute in the first place part of an imaginative-symbolic thought provoked by adversities at the early stages of human development, when on the one hand a concentration of energy is required enabling man to cope with the emergency and on the other serving as a reservoir suitable to be drawn upon. Later experience comes into it and leads to the forming of control-knowledge, the rationalisations of which tend to replace the symbolic response to a greater or lesser extent. Later still the rationalisation pattern shows itself susceptible of losing its cohesiveness and unity. The very rigidity that each of the diverging patterns then taking shape is likely to bring forth, cannot but make room for the re-emergence of the symbolic reactions.

In taking this fundamental position Landheer reduces the role of action even more than he does by his definition of the significance to be attached to "free will."

At present the complaint is heard more and more loudly "that specialization in the social sciences has been carried to such an extreme that the whole body of social knowledge threatens to disintegrate into a multitude of intellectual feudalities." (David Easton, The Political System 1953 p. 101).

It is the great merit of the book under review that its author seeks systematically to lay the foundation for a more unified approach.

Without underestimating the hugeness of the objective he goes beyond trying to delineate the conditions, allowing for the use of procedures a current but facile terminology has come to call "interdisciplinary."

Realizing that this might yield more rewarding results, Landheer has preferred to make the far less easy effort of working out directly appropriate concepts to serve as focus points to all denominations of social thought. Mature as they are, the ideas he forwards in view of that end may be expected to stir up a debate on one of the most disturbing problems of our time. Even then, the objections they are bound to provoke would add to their worth.

Indeed, at the outset of his expositions Landheer makes it clear that he wants to proceed from the idea of structure and to comprehend this as involving, besides the differentiation of age, sex and division of labour over one generation, also one that may be stated in terms of cultural stages only. In that sense he is intent on thinking of mankind as a structural group.

Correspondingly, the concept of change is not regarded as exclusively or even princi-

pally applicable to institutions of informal yet concretely discernible groupings. It is seen as bearing upon man generally. Man's organic structure itself is constantly changing. Viewed from this angle, history becomes "the biological life-process," a process "in which energy is changed into different forms under the cohesion that is involved in the attributes of the species." The full emphasis is laid on processes of change occurring not as a consequence of either individual or social human action, but operating "in that part of human consciousness that is beyond social control, or within social groups which go beyond the limitations of the national state."

It may be worth while to compare Landheer's approach with that proposed by Auguste Comte a century ago. At least the first two of the three stages of civilization through which, according to Landheer, the processes of change are passing (early growth, gradual maturity) remind one of Comte's theological and metaphysical periods. By contrast, Landheer's third stage of late maturity and decay does not have much in common with the positive era of Comte's jubilant prophecies.

As in this respect he takes care to keep as close as possible to his theoretical premises, Landheer's chapters on the development of western civilization succeed fairly well in avoiding Spengler's dilemma. Being an offspring of German historicity, the latter could neither depart so far from the Hegelian system that he ceased fully to comprehend the course of history as a self-consistent whole with a definite beginning and a goal torwards which it was moving, nor refrain entirely from drawing conclusions which somehow anticipated the existentialist thought of later days.

Perhaps it would be going too far to contend that, rather in spite than because of his premises, Landheer's succinct picture of the road along which western civilization travelled towards its present state, scarcely bears the mark of mechanistic thinking. Is the difference in colouring between the theoretical and the descriptive part of the author's work to be attributed to the fact that the mechanistic propositions of the former are already mingled here and there with mystical contemplations, or to the fact that the latter is impregnated in a considerable measure by the author's aestheticism and, moreover, typified by his preoccupation with the secrecies half uncovered but often enough merely alluded to by modern psychology? Perhaps it is due to both these peculiarities of Landheer's highly personal style of thought.

Every time it is intended to project an image of the growth of a civilization over a long stretch of time within the compass of not too many pages, recourse must be taken to broad generalizations. The deficiencies of this procedure are obvious. These are so great that the criticism to the effect that such endeavours must necessarily fail is not wholly unfounded. Being apparently keenly aware of the danger to which his generalizations, too, are exposed, Landheer proceeds with laudable care and circumspection. No word occurs more frequently in his narrative than the adverb "although." Often the subordinate clause, which ensues, formulates a doubt or a reservation. Thus Landheer prevents himself and his readers from being swept away by his fascinating story. This deliberate self-restraint endows it with just that quality of cautiousness generalizing interpretations need in order to become really illuminating.

In writing his book, Landheer aimed at preparing the ground for a new way of thinking commensurate with the global dimensions our society is taking on. Who would deny that the interpenetration of hitherto separated cultures, the increasing use made of computors, enabling man to accomplish deeds transcending the wildest phantasies of yesterday, confront us with the inescapable demand to re-examine all our concepts? To this Landheer has made a contribution of high value, deserving to be read, deserving to be studied.

The closing sentence of his book runs as follows; "The individual is at the root of all things, and it is the individual who can create a world in which we all can live with a reasonable amount of satisfaction if we expect no more than life has to offer: our daily bread, some dreams, some play, and some companionship."

One may wonder whether the contents of this sentence are in perfect accord with those of the preceding chapters. But irrespective of whether they are or not we all will admit that they indicate the goal both contemporary science and action are called upon to keep steadily in mind.

J. J. SCHOKKING [1])

[1] Professor J. J. Schokking teaches political sciences at the University of Cologne; he is also faculty member of the Social Sciences Course in the Institute of Social Studies at The Hague.

FOREIGN STUDENTS IN THE NETHERLANDS

Foreign students per country and per faculty

Country / Nationality	Theology	Law	Medicine	Dentistry	Math. and Physics	Arts	Veterinary Science	Social Science	Geography	Psychology	Pedagogy	Technology	Agriculture
Argentine	—	—	—	—	—	—	—	—	—	—	—	1	—
Australia	—	—	—	—	—	2	—	—	—	—	—	—	—
Austria	2	3	2	—	1	1	—	—	—	—	—	3	—
Belgium	1	6	15	1	2	6	2	2	—	2	—	10	1
Bolivia	—	—	—	—	—	—	—	—	—	—	—	—	—
Bulgaria	—	2	3	—	—	—	—	—	—	—	—	—	1
Canada	1	—	1	—	—	—	—	—	—	—	—	1	—
China	—	—	—	1	—	—	—	—	—	—	—	—	—
Cuba	—	—	—	—	—	—	—	—	—	—	—	1	—
Czechoslavakia	—	—	—	—	—	1	—	—	—	—	—	2	—
Denmark	—	—	1	—	1	—	—	—	—	—	—	—	1
Finland	—	—	—	—	—	—	—	—	—	—	—	1	—
France	—	—	1	—	1	2	—	—	—	1	—	3	—
Germany	9	3	7	2	10	8	—	2	2	—	—	16	—
Greece	—	—	2	—	—	—	—	—	—	—	—	—	—
Hungary	5	1	18	1	12	3	5	6	2	2	1	47	3
Iceland	—	—	—	—	—	—	—	—	—	—	—	1	—
India	—	—	5	—	1	—	—	—	—	—	—	—	1
Indonesia	7	10	138	9	56	9	1	17	4	23	1	216	9
Iran	—	—	1	—	1	—	—	—	—	—	—	—	—
Israel	—	—	7	—	—	—	3	—	—	—	1	6	—
Italy	—	2	3	1	1	2	—	—	—	—	—	—	—
Japan	—	—	—	—	—	—	—	—	—	—	—	—	—
Jordan	—	—	—	—	—	—	—	—	—	—	—	1	—
Korea	—	—	—	—	—	—	—	—	—	—	—	1	—
Latvia	—	—	—	—	1	1	—	—	—	—	—	—	—
Luxemburg	—	—	—	—	1	1	—	—	—	—	—	1	1
Nicaragua	—	—	—	—	—	—	—	—	—	—	—	—	—
Norway	—	1	48	1	—	—	1	—	—	—	—	1	—
Poland	—	—	2	—	—	1	—	—	—	—	1	—	—
Soudan	—	—	—	—	1	—	—	—	—	—	—	—	—
S. Africa	10	4	9	1	3	12	—	—	—	2	6	—	—
Spain	—	1	—	—	1	1	—	—	—	—	—	1	—
Sweden	—	—	2	—	—	—	1	—	—	—	—	1	—
Switzerland	2	2	3	—	1	2	—	—	—	—	—	—	—
Turkey	—	—	—	—	—	—	—	—	—	—	—	1	—
United Kingdom	—	3	4	—	3	4	—	1	—	1	—	3	—
U.R.A.	—	—	—	—	—	—	—	—	—	—	—	1	6
U.S.A.	10	1	116	—	13	16	—	—	—	2	—	7	—
U.S.S.R.	—	—	—	—	—	—	—	—	—	—	—	—	—
Venezuela	—	—	—	—	1	—	—	—	—	—	—	—	—
Yugoslavia	—	—	—	—	1	—	—	—	—	—	—	2	—
Stateless	1	4	13	1	10	5	2	1	—	3	—	12	2
Total	48	43	401	18	122	77	15	29	8	36	10	340	25

Foreign students per country and per university

Total 1957/58	Total 1956/57	Leyden	Utrecht	Groningen	Amsterdam	Amsterdam Free Ref. Univ.	Nijmegen	Delft	Eindhoven	Wageningen	Rotterdam	Tilburg	Country / Nationality
1	—	—	—	—	—	—	—	1	—	—	—	—	Argentine
2	—	—	—	—	2	—	—	—	—	—	—	—	Australia
6	12	3	4	—	4	—	—	3	—	—	1	1	Austria
3	42	5	9	—	8	2	14	10	—	1	1	3	Belgium
—	1	—	—	—	—	—	—	—	—	—	—	—	Bolivia
6	6	—	2	1	2	—	—	—	—	1	—	—	Bulgaria
3	2	1	—	—	—	1	—	1	—	—	—	—	Canada
1	1	—	1	—	—	—	—	—	—	—	—	—	China
1	1	—	—	—	—	—	—	1	—	—	—	—	Cuba
3	2	1	—	—	—	—	—	2	—	—	—	—	Czechoslovakia
3	6	—	1	—	1	—	—	—	—	1	—	—	Denmark
1	1	—	—	—	—	—	—	1	—	—	—	—	Finland
0	8	1	—	—	4	—	2	3	—	—	—	—	France
3	86	12	6	4	18	9	1	15	1	—	7	—	Germany
3	5	1	—	1	1	—	—	—	—	—	—	—	Greece
6	56	10	17	7	11	9	8	46	1	3	1	3	Hungary
2	2	—	—	—	1	—	—	1	—	—	—	—	Iceland
7	4	—	—	—	2	—	4	—	—	1	—	—	India
9	730	82	41	10	168	38	12	215	1	9	50	3	Indonesia
2	—	—	—	2	—	—	—	—	—	—	—	—	Iran
9	17	1	4	—	7	—	—	6	—	—	1	—	Israel
9	10	4	2	1	1	1	—	—	—	—	—	—	Italy
—	1	—	—	—	—	—	—	—	—	—	—	—	Japan
1	3	—	—	—	—	—	—	1	—	—	—	—	Jordan
1	—	—	—	—	—	—	—	1	—	—	—	—	Korea
2	2	1	1	—	—	—	—	—	—	—	—	—	Latvia
4	2	—	—	—	2	—	—	1	—	1	—	—	Luxemburg
—	2	—	—	—	—	—	—	—	—	—	—	—	Nicaragua
2	36	3	19	29	—	—	—	1	—	—	—	—	Norway
5	4	—	—	—	1	—	3	—	—	—	1	—	Poland
1	—	1	—	—	—	—	—	—	—	—	—	—	Soudan
9	49	8	8	7	11	15	—	—	—	—	—	—	S. Africa
4	3	1	—	—	2	—	—	1	—	—	—	—	Spain
4	3	1	1	1	—	—	—	1	—	—	—	—	Sweden
2	13	4	1	—	6	1	—	—	—	—	—	—	Switzerland
1	—	—	—	—	—	—	—	1	—	—	—	—	Turkey
2	22	9	—	2	5	1	1	2	1	—	1	—	United Kingdom
8	6	—	—	—	1	—	—	1	—	6	—	—	U.R.A.
8	202	71	12	8	54	12	3	7	—	—	1	—	U.S.A.
—	1	—	—	—	—	—	—	—	—	—	—	—	U.S.S.R.
1	1	—	—	1	—	—	—	—	—	—	—	—	Venezuela
4	1	—	—	—	2	—	—	1	1	—	—	—	Yugoslavia
5	60	4	6	5	25	4	2	12	—	2	5	—	Stateless
364	1403	224	135	79	339	93	50	335	5	25	69	10	Total

DOCTORAL DISSERTATIONS

Theology

BEUSEKOM, JOHAN HENDRIK VAN. *Het experiment der gemeenschap. Een onderzoek naar plaats en functie van de "orde" in de reformatorische Kerken.* (The Experimental Community. A study of the place and function of "religious orders" in the churches of the Reformation). The Hague, 1958.
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OOSTHUIZEN, GERHARDUS CORNELIS. *Theological Discussions and Confessional Developments of the Churches of Asia and Africa.* Franeker, 1958.
Free (Reformed) University of Amsterdam.

VERHEUS, SIMON LEENDERT. *Kroniek en kerugma. Een theologische studie over de Geschichtsbibel van Sebastiaan Franck en de Maagdenburger Centuriën.* (Chronicle and Kerygma. A theological study on the Geschichtsbibel of Sebastiaan Franck and the Magdenburger Centuriën). Arnhem, 1958.
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WYK, WILLIE BURGER VAN. *Die versoeningsleer in die Rakouer kategismus.* (The Theory of Reconciliation in the Rakouer Catechism). Kampen, 1958.
Free (Reformed) University of Amsterdam.

Law

DRIELSMA, HENRI ABRAHAM. *De wetsinterpretatie in het fiscale recht en de rechtsbescherming van de Nederlandse staatsburger.* (The Legal Interpretation of Fiscal Laws and the Legal Security of the Netherlands Citizen). Deventer, 1958.
With a summary in English.
State University at Utrecht.

IMKAMP, MARIA JOSEPH JACOBUS ANTONIUS. *Prijsdiscriminatie in Amerika en in het E.G.K.S.-verdrag.* (Price Discrimination in America and in the E.C.C.S. Treaty). The Hague, 1958.
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Medicine

ARTS, NICOLAAS FERDINANDUS THERESIA. *Een onderzoek over het vaatstelsel van de placenta.* (A Study on the Vascular System of the Placenta). Nymegen, 1958.
With summaries in English, French and German.
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BOEKELMAN, WILLEM ANTONIUS. *Erythrocytennatrium en schildklierfunctie.* (Sodium Content of Erythrocytes in Hyperthyroidism). Utrecht, 1958.
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CREVEL, HANS VAN. *The Rate of Secondary Degeneration in the Central Nervous System. An experimental study in the pyramid and optic nerve of the cat.* Leyden, 1958.
With a summary in Dutch.
State University at Leyden.

DAMSTE, PIETER HELBERT. *Oesophageal Speech after Laryngectomy.* Groningen, 1958.
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DEKKER, EGBERT. *De invloed van de intrathoracale druk op de wijdte en stromingsweerstand van de luchtwegen bij normale proefpersonen en bij patiënten met asthma en emphyseem.* (The Influence of Intrathoracic Pressure on the Diameter and Flow Resistance of the Respiratory System in Normal Individuals and in Patients with Asthma and Emphysema). Rotterdam, 1958.
With a summary in English.
State University at Groningen.

DONGEN, MARIUS ADRIANUS VAN. *Beschouwingen over het gebruik van thiouracil en kwaadaardige afwijkingen van de schildklier.* (Observations on the Use of Thiouracil and the Malignant Degeneration of the Thyroid Gland). Leyden, 1958.
With summaries in English, French and German.
Roman Catholic University at Nymegen.

GANS, JOHANNES CORNELIS. *Studies on Pulmonary Shadows Associated with Infection with Respiratory Viruses in Military Servicemen.* Amsterdam, 1958.
State University at Leyden.

GEVERS, RUDOLF HANS. *Enige aspecten van de water- en zouthuishouding in verband met de therapie van de zwangerschapstoxemie.* (Some Aspects of the Water and Salt Metabolism in Connection with the Therapy of the Toxemia of Pregnancy). Assen, 1958.
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GREEP, JACOBUS MARINUS. *Antithrombine en aandoeningen van het pancreas.* (Antithrombin and Diseases of the Pancreas). Rotterdam, 1958.
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HAAS, GOVERT DE. *Een onderzoek naar vóórkomen en betekenis van ongevallen, die in de woning plaats vinden.* (An Enquiry into the Incidence and Meaning of Accidents that Occur in the Home). Groningen, 1958.
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HORST, JOHAN NICOLAAS VAN DER. *De normale reactie van de huidtemperatuur van de mens bij wisselende omgevingstemperaturen.* (The Normal Reaction of the Skin Temperature of Man to Various Environment Temperatures). The Hague, 1958.
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State University at Utrecht.

HOUTZAGERS, JOHAN JACOB REYNIER. *De orale therapie van diabetes mellitus.* (The Oral Therapy of Diabetes Mellitus). Utrecht, 1958.
With a summary in English.
State University at Utrecht.

HULSMANN, WILLEM CHRISTIAAN. *Over het mechanisme van de ademhalingsketenphosphorylering.* (On the Mechanism of Oxidative Phosphorylation). Amsterdam, 1958.
With a summary in English.
Municipal University of Amsterdam.

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With summaries in English and Indonesian.
Municipal University of Amsterdam.

MOLENAAR, BAUCO BART. *Speekselkliergezwellen. Kliniek, pathologische anatomie en resultaten van de operatieve bahandeling.* (Tumours of the Salivary Gland. Clinic, pathological anatomy and results of the operative treatment). Groningen, 1958.
With a summary in English.
State University at Groningen.

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With summaries in English, French and German.
State University at Utrecht.

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With a summary in English.
State University at Leyden.

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State University at Utrecht.

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With a summary in English.
Municipal University of Amsterdam.

TAMMELING, GOOSZEFUS JOHANNES. *Het residuaalvolume en de functionele residuaal capaciteit. Methodiek en klinische interpretatie.* (The Residual Volume and the Functional Residual Capacity. Methods and clinical interpretation). Assen, 1958.
With a summary in English.
State University at Groningen.

TON, JAN GERRIT. *Reflux Oesophagitis.* 1958.
Municipal University of Amsterdam.

VALK, JOHANNES MICHIEL VAN DER. *Onderzoekingen over de electrische huidweerstand.* (Investigations on the Electrical Skin-resistance). Amsterdam, 1958.
With a summary in English.
Municipal University of Amsterdam.

WEIJEL, JACQUES ALBERT. *Psychiatry in General Practice.* Amsterdam, 1958.
With a summary in Dutch.
Municipal University of Amsterdam.

ZEEGERS, MACHIEL. *De psychopathologie van de oplichter onder anthropologisch aspect.* (Anthropological Aspect of the Psychopathology of the Swindler). Utrecht, 1958.
With a summary in English.
Municipal University of Amsterdam.

Arts

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With summaries in English, French and German.
Roman Catholic University at Nymegen.

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With a summary in Italian.
State University at Leyden.

CATE-SILFWERBRAND, RAGNHILD BIRGITTA TEN. Vlees, *bloed, en been. Synoniemvergelijkend onderzoek van drie Germaanse woordformaties.* (Flesh, Blood and Bone. An investigation into the formation of three Germanic words, based on synonym comparison). Assen, 1958.
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State University at Utrecht.

DROP WLLEM. *Verschijningsvormen van de Nederlandse historische roman in de negentiende eeuw.* (Forms of Publication of the Dutch Historical Novel in the Nineteenth Century). Assen, 1958.
State University at Utrecht.

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With a summary in French.
Municipal University of Amsterdam.

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State University at Utrecht.

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With a summary in English.
Municipal University of Amsterdam.

MULLER, ADRIAAN D. *Die antropologiese psigologie van Hans Trüb. Grondbeginsels van 'n nuwe psigoterapeutiese methode.* (The Anthropological Psychology of Hans Trüb. Basic elements of a new psychotherapeutic method). Amsterdam, 1958.
With summaries in English and German.
Free (Reformed) University of Amsterdam.

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State University at Utrecht.

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With a summary in English.
Municipal University of Amsterdam.

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With a summary in Dutch.
Municipal University of Amsterdam.

HARTOGH, CHRISTIAAN DIRK. *Cluster Developments for Jastrow Wave Functions.* 1958.
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State University at Leyden.

HEYMANN, DIETER. *Some Aspects of Thermal Diffusion at Low Concentrations.* 1958.
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Municipal University of Amsterdam.

HOOGENBOOM, ADRIANUS MARIA. *Investigation of the $Si^{30}(p,\gamma)P^{31}$ Reaction. Introduction of the sum-coincidence method.* The Hague, 1958.
With a summary in Dutch.
State University at Utrecht.

KLAPWIJK, TEUNIS. *Enige gemengde additie van broom.* (The Mixed Addition of Bromine to Unsaturated Compounds). Delft, 1958.
With a summary in English.
State University at Leyden.

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Municipal University of Amsterdam.

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Free (Reformed) University of Amsterdam.

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State University at Utrecht.

NIEUWENHUIS, JOHANNES. *Reactie van acetyleenaethers met ketenen en isocyanaten.* (Reactions of Ethoxyathene with Ketenes and Isocyanates). Groningen, 1958.
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State University at Leyden.

RAAT, JAN HENDRIK. *Comfort and Indoor Climate in Paramaribo (Surinam).* Groningen, 1958.
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State University at Utrecht.

RAPPOLDT, MENSO PIETER. *Photochemische reacties van provitaminen D en verwante verbindingen.* (Photchemical Reactions of Provitamins D and their Isomers). The Hague, 1958.
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Municipal University of Amsterdam.

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Municipal University of Amsterdam.

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With a summary in Dutch.
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With a summary in Dutch.
Free (Reformed) University of Amsterdam.

WAARD, ADRIAAN DE. *Investigations on the Intermediates in the Biosynthesis of Fatty Acids and Cholesterol.* Nymegen, 1958.
With summaries in Dutch and French.
State University at Utrecht.

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State University at Utrecht.

ZEELENBERG, ARIE PIETER. *Enige onderzoekingen over snelle radicaal-reacties in de gasfase met behulp van kinetische spectroscopie.* (Some Spectroscopic Investigations on the Explosive Oxidation Reactions in the Gaseous Phase). Leyden, 1958.
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State University at Leyden.

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DAS GUPTA, JYOTI BHUSAN. *Indo-Pakistan Relations (1947-1955).* Amsterdam, 1958.
Municipal University of Amsterdam.

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With general discussion and conclusions in Dutch and with summaries in Dutch and German.
State University at Utrecht.

BOUW, JACOB. *Blood Group Studies in Dutch Cattle Breeds.* Wageningen, 1958.
With summaries in Dutch, French and German.
State University at Utrecht.

Economics

BOSCH, JAN. *Enkele sociaal-economische gevolgen van de automatie.* (Some Social Economic Consequences of Automation). Leyden, 1958.
With a summary in English.
Municipal University of Amsterdam.

MULDER, ENNO. *Bedrijfseconomische aspecten van de materieel-logistiek.* (Industrial Economic Aspects of Material Logistics). The Hague, 1958.
With a summary in English.
Netherlands School of Economics at Rotterdam.

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With a summary in English.
Technological University at Delft.

KONIJN, JOSEPH. *Experiments on Nuclides Decaying by Positon and Electron Capture.* 1958.
With a summary in Dutch.
Technological University at Delft.

NOOYEN, BOB VAN. *Some Methods in Nuclear Spectroscopy.* Amsterdam, 1958.
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Technological University at Delft.

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With a summary in English.
Technological University at Delft.

RIVIERE, JAN WILLEM MAURITS LA. *On the Microbial Metabolism of the Tartaric Acid Isomen.* Delft, 1958.
With a summary in Dutch.
Technological University at Delft.

SPARENBERG, JOHAN ADOLF. *Applications of the Hilbert Problem to Problems of Mathematical Physics.* Delft, 1958.
Technological University at Delft.

Erratum

In Vol. II no. 4, p 39, the dissertation of MENSINK, BERNARDUS ANTONIUS, was erroneously said to have been presented at the State University at Leyden. This should have read: Roman Catholic University at Nymegen.

BASIC DATA ON INTERNATIONAL COURSES OFFERED IN THE NETHERLANDS [1]

(see also the "International Courses" Section in this Bulletin)

Institute of Social Studies

Information: The Rector, Institute of Social Studies, 27, Molenstraat, The Hague.

COURSES OFFERED:

a. Two-year Course in the Social Sciences. The study of social change and economic development in the widest sense. The course leads to the degree of Master of Social Sciences.
REQUIREMENTS FOR ADMISSION: Advanced academic standing in one of the social sciences.
NEXT COURSE STARTING: September 1959. Closing date for applications: June 1, 1959.[2]

b. Six-Month Advanced Diploma Course in Public Administration.
REQUIREMENTS FOR ADMISSION: Advanced academic status and preferably some years of experience in the public service.
NEXT COURSE STARTING: January 1960. Closing date for applications: October 1, 1959.[2]

c. Six-Month Advanced Diploma Course in Economic Planning and Social Accounting.
REQUIREMENTS FOR ADMISSION: Advanced academic status and preferably some years of experience in the public service.
NEXT COURSE STARTING: January 1960. Closing date for applications: October 1, 1959.[2]

d. Seven-Month Advanced Diploma Course in Social Welfare Policy for Low Income Countries.
REQUIREMENTS FOR ADMISSION: Practical experience in social work, preferably at the teaching and public service level.
NEXT COURSE STARTING: September 1959. Closing date for applications: June 1, 1959.[2]

Technological University at Delft — Netherlands Universities Foundation for International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

International Course in Hydraulic Engineering.
Three branches of study:
1. Tidal and coastal engineering;
2. Reclamation;
3. Rivers and navigation works.

The course lasts eleven months and leads to a Diploma.

REQUIREMENTS FOR ADMISSION: a degree in engineering of a recognized institution of higher learning.

NEXT COURSE STARTING: October 1959 (at Delft).

Free (Reformed) University of Amsterdam - Netherlands Universities Foundation For International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

Summer Course of the Combined Netherlands Universities, 1959.
Subject: Religion and Culture.

REQUIREMENTS FOR ADMISSION: Students or graduates of an institute of higher education.
NEXT COURSE: July 1959.

Research Institute for Management Science — Netherlands Universities Foundation for International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

International Course on Small-Scale Industries. Theoretical and practical training in investigating and solving the specific problems of small-scale industries, and in finding a methodology which can be applied to the establishment of new industries. Successful attendance of the course leads to a diploma.

REQUIREMENTS FOR ADMISSION: B.Sc. or M.Sc. in engineering or equivalent degree of recognized universities.

NEXT COURSE: May 1959 until end of October 1959; November 1959 until end of April 1960.

International Training Centre for Aerial Survey

Information: The Dean, International Training Centre for Aerial Survey, 3, Kanaalweg, Delft.

[1] Courses are given in English only, unless otherwise mentioned.
[2] For Indian Citizens application will close one month earlier.

INTERNATIONAL COURSE ON SMALL-SCALE INDUSTRIES

The Research Institute for Management Science at Delft will organise the 6th International Course on Small-Scale Industries between November 3, 1959 and April 27, 1960.

This six-month's postgraduate course is designed for persons preferably with an engineering degree or a comparable level of knowledge obtained through several years of industrial experience. The course is divided into two equal periods, one dedicated to theoretical instruction and the other to individual practical work. Instruction is given in the English language.

A choice can be made from three branches of study

- **Establishment of new industries**
- **Improvement of conditons in existing industries**
- **Establishment and management of training centres, institutions and organisations for the promotion of, and assistance to, small-scale industries.**

All enquiries should be addressed to:
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COURSES OFFERED:

a. Photogrammetry, including cartography, topography and theory of errors;

b. Photogeology;

c. Use of air photographs for soil survey and other agricultural purposes;

d. The same for forestry and other sylvicultural purposes;

e. Air photography and survey navigation.
Lectures and instruction are given in English, French or German.
Courses are adapted to individual needs, and may therefore vary from some months to two years.

REQIREMENTS FOR ADMISSION: Dependent upon the individual student's programme of study.

NEXT COURSE(S) STARING: September 1959, and January 1960.

Roman Catholic University at Nymegen

Information: Facluty of Theology, 13, Wilhelminasingel, Nymegen.

COURSE OFFERED:

"Theological Week." This course will be held 19-22 July, 1959.

Institute of Oriental Studies, Leyden

Information: The Secretary, Institute of Oriental Studies, 61, Rapenburg, Leyden.

COURSES OFFERED:

Language and culture of Indonesia and Malaya, the Arabian Countries, Japan, China.

REQUIREMENTS FOR ADMISSION: Candidates must be qualified for university studies in their own country.

NEXT COURSES STARTING: October 1959 (duration 3 or 7 months).

The Hague Academy of International Law

(Founded in 1923 with aid from the Carnegie Endowment).

Information: The Secretariat, The Hague Academy of International Law, Peace Palace, The Hague.

COURSES OFFERED:

a. 30th Summer Session, 1959 (consisting of two periods). Lectures on international law in English and French are given in both periods. At the end of each period students admitted to the course sit for examination, which leads in the case of a pass to the award of a diploma.

REQUIREMENTS FOR ADMISSION: Study and/or practical experience in international law; university professors and students, civil servants, judges, lawyers, diplomatic, consular and international officers.
NEXT COURSE: 1st period: July 13–31, 1959; 2nd period: August 3–21, 1959.

b. 3rd Session of the Centre of Studies and Research in International Law and International Relations. During this session 30 specially selected scholars will be dealing with case-studies in international law.
Attendants of the course will be divided into an English-speaking and a French-speaking group, each with its own Director of Studies.
REQUIREMENTS FOR ADMISSION: advanced academic degree, such as the Academy's diploma, or proof of at least three years' actual practice in international affairs.

Netherlands Universities Foundation for International Co-operation

Information: NUFFIC, 27, Molenstraat, The Hague.

COURSE OFFERED:

"Survey of the Netherlands" — introductory courses on the Netherlands, lasting about one week.

REQUIREMENTS FOR ADMISSION: usual requirements for university study.

NEXT COURSE: courses will be given during summer months, upon request, for groups of at least 15 students.

Bouwcentrum (Building Centre)

Information: Bouwcentrum, P.O. Box 299, Rotterdam.

COURSE OFFERED:

International Course on Building – in co-operation with the Central Organization for Applied Scientific Research in the Netherlands, TNO, and the International Federation of Housing and Town Planning. The course is on the graduate level and lasts six months. Its object is to present a systematic basis for the treatment of the problems encountered in the building industry and to suggest a number of practical methods for tackling these problems.

REQUIREMENTS FOR ADMISSION: B.A., B.Sc. or equivalent degree of recognized universities or colleges. Applicants must, in their own countries, have a task concerned with building.

NEXT COURSE STARTING: October 1959.

The Philips International Institute of Technological Studies

Information: Director of Studies, Philips International Institute, Eindhoven.

COURSES OFFERED:

a. Individual, theoretical and experimental curricula on any subject within the range of Philips' activities; for instance, electronics and applications thereof, X-rays, light and lighting, etc.
b. Three-month course of lectures on basic electronics (October–December).
c. Three-month advanced-level course of lectures. The main subject of this course may differ from year to year but will generally be related to some form of applied electronics.

Teaching language is English. Nominal duration of a complete period of study is one year.
REQUIREMENT FOR ADMISSION: a graduate science degree.

Commencement of next course: In view of the individual character of the study, students may enter upon their course at any date; the courses mentioned will, however, usually start in October and February.

Ministry of Education, Arts and Sciences

Information: Congress Organization Office, Ministry of Education, Arts and Sciences, 3, R. J. Schimmelpennincklaan, The Hague.

COURSES OFFERED:

a. Summer Course on Dutch Language and Culture, Utrecht, 1959.
REQUIREMENTS FOR ADMISSION: Participants must be French-speaking persons, interested in Dutch language and culture by virtue of their profession of for other reasons.

b. Vacation courses for Belgian teachers, Amsterdam, 1959.
REQUIREMENTS FOR ADMISSION: Participants must be engaged in teaching in Belgium.
The courses are organized within the framework of the Netherlands-Belgium Cultural Agreement.
Further particulars will be published in a following issue.

International Agricultural Centre at Wageningen.

Information: Director, International Agricultural Centre, 1, Generaal Foulkesweg, Wageningen.

COURSES OFFERED:

a. Qualification courses, during which students from abroad will be trained in a number of specific subjects, including the Dutch language, which will form a basis for a successful full-time Honours Course at the State Agricultural University at Wageningen, leading to the degree of "Landbouwkundig Ingenieur" (M. Sc.).
REQUIREMENTS FOR ADMISSION: B.Sc. or equivalent, degree of recognized universities or colleges.
Next course: October 1959.

b. Research and specialization facilities in special branches of agricultural science, after completion of which a certificate is awarded. Training is adapted to individual needs and may vary from 3 to 12 months.
REQUIREMENTS FOR ADMISSION: in general, M. Sc. or equivalent degree of recognized universities or colleges.

c. International meeting on methods and programme planning in agricultural and home economics extension, Wageningen, July 6–31, 1959. Lectures, discussions and "workshops" by experts from F.A.O., O.E.E.C. and from various countries, practical field training in small groups and field trip through characteristic extension areas in the Netherlands.
Fee: Dfl. 780,—, being approximately U.S. $ 206.— £ 74.—.

This amount includes administration fee; board and lodging at Wageningen and during field trips; transport charges during field trips and local visits; programmes, papers, and similar publications.

The following institutions of higher education participate in the Netherlands Universities Foundation for International Co-operation:

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State University at Groningen
State University at Utrecht
University of Amsterdam
Free (Reformed) University of Amsterdam
Roman Catholic University at Nymegen
Technological University at Delft
Agricultural University at Wageningen
Netherlands School of Economics at Rotterdam
Roman Catholic School of Economics at Tilburg
Technological University at Eindhoven

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